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Electric Motor Drives *for* Rubber Machinery

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THE B. F. Goodrich Co. began in 1898 to use electric motors experimentally to drive calenders. Since that time there has been a steady addition of motor drives and a marked increase in all the equipment required to meet the additional electric power demand. In 1910-11 certain gear driven calenders were changed over to motor drive. The gear drives on calenders made available only two speeds by means of gear changes. The maximum yardage rate was 18 or 19 yards per minute and the minimum, about half that speed with no possibility of an intermediate speed. It is now possible to make almost any adjustment desired, while speeds have been increased greatly, even up to 50 yards or more per minute.

With respect to a calender, heating naturally increases as the friction ratio increases. Thus the stock becomes hotter at higher rates of production necessitating installation of better cooling facilities. For example, changing the friction ratio of a certain calender from 1½ to 1 to 2 to 1, delivery of the same yardage rate was impossible until the calender piping of increased size was rearranged to permit the circulation of an increased volume of water. This increase of friction ratio demanded more power from the motor. It has been found a good rule of thumb that the proportionate increase of power is about equal to the sum of the peripheral speed of the rolls either of calenders or mills.

The electric drive has been the means to study the peculiarities of the power demands for individual rubber manufacturing processes and to estimate the mechanical strains in machines, thus enabling the designer to make proper allowances for the factor of safety in gears and other parts. The portable graphic wattmeter shown in the illustrations is very useful for securing data to use in designing a drive to meet specific conditions of power and strength.

As early as 1909 or 1910 the size of motor to drive a line of 84-inch mixing mills was fairly well established but not so with respect to crackers, sheeters, single warming mills, etc. With respect to this group the power problem was solved by making ample allowance in the power-supply circuits and in the pull-out torque of the motor.

Synchronous motors were applied for rubber work in 1919. The advantage of this type of motor was considered to be power-factor correction and somewhat higher pull-out torque obtainable when occasion required. The same problem of safety was present with synchronous as with induction motor applications, that is, the magnetic clutch had to be retained because of the very low starting torque of the synchronous motor that was first offered as rubber mill drives. Improved synchronous motors are practically all that can be desired from the standpoint of assured starting ability, pull-out torque, and safety. The emergency stop can now be secured by means of dynamic braking or plugging. The magnetic clutch served well in its day but the synchronous motor is much more satisfactory as to safety and other practical features.

It is virtually settled that for most lines of 84-inch mixing mills there should be an allowance of about 125 h.p. per mill to carry the peak loads. In certain classes of work, however, larger motors are needed and again the motor rating can be reduced. In the operation of rubber crackers the ratio of average load to peak load is usually 3¼ or 3½ to 1. The average load of a cracker is not much over 50 or 60 h.p., while the peak may reach momentarily as high as 200 h.p. or practically 4 to 1. The ratio of average load to peak load in the case of a sheeter is about 1½ to 1.

The Banbury mixer is the most recent development in rubber mixing machinery. Originally there was much discussion as to its proper size of motor. The present practice is to use a unit coupled direct to the line shaft and having a rating of 500 h.p. for size No. 27.

For the operation of a 16 by 42-inch warming mill it seems definitely settled that a 75 h.p. induction motor is sufficient for all classes of work and a 150 h.p. motor for a 20 by 60-inch mill. The synchronous motor is considered the best drive for a single mill when taking into account just the factors of pull-out torque and power-factor correction. If the latter point is not essential and first cost is important, an induction motor is used provided pull-out torque is sufficient.

In making application of synchronous motors to individual warming mills the 125 h.p. .8 P.F. motor does very well for the 20 by 60-inch mill. In the case of the 16 by 42-inch mill the 75 h.p. .8 P.F. motor may as well be chosen since the 60 h.p. size does not cost much less. There is the further consideration that the single mill installation is often on feeder with many small motors. In such case the surplus capacity above that required for the mechanical load can well be employed for power-factor correction.

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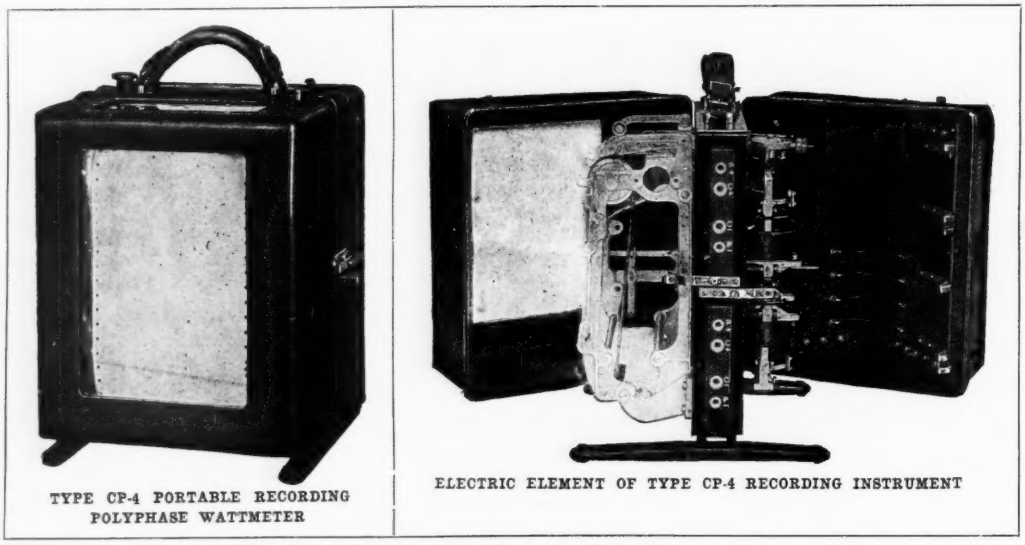
Tubing machines are about the most troublesome of any to which to apply motors, especially in a department where miscellaneous work is conducted with frequent changes in stocks and die sizes. About the only way to cope with such a situation is to apply a motor large enough for the extreme condition and risk so that it will be run below its rating more or less of the time. It is pretty well settled that a 6-inch tubing machine with worm speed of 65 r.p.m. operating on tire tread or tubing requires a 50 h.p. motor. There can be variations from these specifications to comply with special power requirements.

The choice of motor then is the one nearest to that value. This rule applies more especially to belts dragging on stationary supports. Where the belt is supported by rollers mounted in ball-bearings, the starting effort is much less. At best the job is always over-motored and this will continue so until a motor is produced that will have much better starting ability and yet have good efficiency and power factors. The realization of this may be a long way off; so the best expedient in nearly all cases is the standard squirrel-cage motor.

In many rubber plants where there is occasion to use motors, they probably do not run above 10-15 h.p. and the large majority 7½ h.p. and below. In the case of motors of 10 h.p. and over it should be possible to find motors having special starting torque characteristics, which would considerably simplify the problems of motor applications in the larger installations.



TYPE CP-4 PORTABLE RECORDING POLYPHASE WATTMETER

ELECTRIC ELEMENT OF TYPE CP-4 RECORDING INSTRUMENT

General Electric Portable Wattmeter

The use of conveyers is entering into many manufacturing methods. They are freakish things to which to apply motors because of the excessive starting effort they require compared with their average load value after the motor has brought them to full speed. In general the torque required to start is 2.3 times the running torque of the load as found.

Non-stretchable Play Ball

Inflatable play balls such as basket-balls, footballs, soccer, volley, and waterpolo balls, etc., are open to the objection that they soon stretch and lose their shape under normal playing conditions. An invention, lately patented,[1] that obviates this difficulty provides for molding balls of this type with all the stretch removed from the outer covering.

The cover of the improved ball, cut in accordance with any pattern or design, is made smaller than the size of the completed ball. For example, if a spherical leather-covered basket-ball of 30 inches circumference is desired, the original cover is cut to have a circumference of about 28.6 inches. The amount of cover undersize depends upon the material used, its strength, thickness, stretching quality, etc.

After completing the undersize cover, a rubber bladder is inserted and it is placed in a two part-mold with cavity measuring 30 inches in circumference. When the ball is inflated to fill the mold and cured, it is so stretched that it will stretch no more under normal service conditions.

In the case of a leather basket-ball designed for a normal pressure of about 13 pounds, this initial stretching may be accomplished by imposing a pressure of 25 pounds for about 12 hours and then increasing the pressure to about 80 pounds, leaving the ball in the mold for 12 hours longer.

The time and pressure required for stretching depends upon the material used, size and shape of the ball, and whether or not the cover is lined with fabric.

[1] U. S. Patent No. 1,713,216, May 14, 1929.

Approved S. A. E. Standards

Extensive changes were recently made by the Standards Committee of the S. A. E. The table of high-pressure tires and rims, and that of balloon tires and rims for commercial vehicles, were revised and approved as follows:

HIGH-PRESSURE TIRES AND RIMS FOR COMMERCIAL VEHICLES

Section Size, In.	5	6	7	8	8	9-10	9-10
Rims							
Width between Flanges	3.75	4.33	5.00	6.00	6.00	7.33	7.33
Flange Height	1 7/32	1¼	1¼	1½	1½	1¾	1¾
Tires							
Sizes for 20 and 24-In. Rims	5	6[1]	7	8	9	9	10
Maximum Permissible Section on Above Rims	6.05	6.90	8.05	9.20	9.90	10.35	11.50

[1] Eight-ply 6-in.-20 tire to be 6.55 in. maximum on 5-in truck rim.

BALLOON TIRES AND RIMS FOR COMMERCIAL VEHICLES

Section Size, In.	5	6	7	7	8	8	9-10
Rims							
Width between Flanges	3.75	4.33	5.00	5.00	6.00	6.00	7.33
Flange Height	1 7/32	1¼	1¼	1¼	1½	1½	1½
Tires							
Sizes for 20-In. Rims	7.00	7.50	8.25	9.00	9.75	10.50	10.50
Sizes for 22-In. Rims	...	...	8.25	9.00	9.75	....	....
Maximum Permissible Section on Above Rims	7.20	7.75	8.50	9.25	10.05	10.30	10.80

Routine Testing in the Tire Factory

The Author, "Shell Gatherer," Gives an English Opinion to Which He Would Be Glad to Receive an American Reply

DURING the course of manufacture of any product it becomes necessary to check that manufacture at various points. The necessity for such examination or testing is to insure uniformity of perfect production. In the case of tires and other rubber articles there are rubbers, cottons, drugs, etc., that must be tested and examined on delivery to see that they are up to the desired standard of quality and of uniformity. In order to insure further uniformity, the various rubbers and drugs from different consignments are mixed so as to even up any small differences. The mixed compounds are tested during and after mixing. Cottons are tested prior, during, and after processing. The component parts of the finished product are examined for correct dimensions and settings during assembly. The cure is checked and automatically recorded; while the tires are examined finally for manufacturing defects, prior to being sent to finished stock stores.

Routine and Snap Testing

If routine testing is carried to an extreme, it does become most expensive, both in material and in labor. The object of routine testing should be to encourage pride of workmanship and to let the operative feel he will be found out, if producing inferior work. If operatives know that every tire is examined at frequent points, there will be a greater tendency to produce indifferent work, than if snap testing were employed. Snap testing of workmanship is admitted generally to produce a better effect.

Snap testing may defeat its own object if carried too far. It is a question of how far snap testing should be carried, and what percentage of the tires should be examined. As a rule it should be clear that tires examined at one point for any object, should not be examined again at another point, even if for another object. The tendency should be to examine as many tires as possible at the total examining points, thus insuring that the bulk of the production is examined at some point or other of its manufacture. Examiners should be instructed to look for any fault and not only faults that may occur immediately prior to examination.

The policy of testing at certain fixed points in manufacture is good, but not unless there are snap testers walking around the factory examining the tires at any stage of their manufacture. Certain defects may not be evident on examination but may be noticed during the actual process of manufacture, such as uneven or excessive pocket or tread stretch. Care should be taken not to waste time checking material that has been checked and passed previously. The cord preparing department will have checked its own product, so that it should not be necessary to check the material again when it comes to assembly. Material that is obviously faulty should be rejected and not used in manufacture.

Importance of Material

So far the labor costs and points of testing have been mentioned, but there is another and maybe more important aspect, that of material. There is always the possibility of a large wastage of material in testing that may not be noticed immediately. Up to the compounding there is little danger of loss; the material is still in a rough state and after some tests, such as plasticity tests, may be returned to the stock. At the same time, it is generally cheaper to waste a small piece of rubber from the mixed stock than to take test strips from a finished tire, and so scrap the tire. The author fails to see any real object in cutting up tires for the purpose of routine testing. What object can be served by scrapping an expensive product, that could not be served in some less expensive manner? The results obtained from the cutting up of a tire are: (1) Condition of cure of the various stocks; (2) Tire assembly and dimensions; (3) Weight of spreading; (4) Cotton tensions; (5) Adhesion between component parts.

Assuming that the tire is correctly designed and that the assembly and cure have been initially tested, there should be no necessity for the cutting up of tires for routine testing. By examining the above four results it will be seen that these can be checked or assured in a cheaper manner.

1. Condition of Cure. If a stock is physically tested from a correctly cured and molded test piece, the condition of that stock is not likely to change before becoming part of the tire.

2. Tire Assembly and Dimensions. These points are examined during the course of manufacture. Why examine again? The author does not lose sight of ply slippage or such defects, but such points should be guarded against in the constructional design.

3. Weight of Spreading. This is tested during cord processing and observed during the course of manufacture of the tire.

4. Cotton Tensions. These have been tested and examined in the initial tests of the newly designed tire. The process bead setting, bias angles, and method of construction are checked frequently during manufacture.

5. Adhesions. These also were examined and tested in the initial tests. Provided the process is properly observed, there should be little variation in the adhesions of the various components. From which it will be seen that the cutting up of tires for such final routine testing can serve little if any useful purpose. It is seldom that any real action is taken on the results or records of such tests. They become pure routine and as such are liable to be ignored or given scant attention. Most of all they cost a large amount of money in wastage of material and in time preparing the various tests; money that could be saved or at most spent to better advantage.

Control of Testing

Finally on the subject of routine testing there is the question as to who should control the testing during manufacture. A certain amount of checking is done by the operatives, in which case these must come under the control of the shop

manager. The remainder of the testing may be divided into two groups: that done to insure correct dimensions, settings, etc., and that done to insure correct physical properties. In the first case the author is of the opinion that such examining may be left in the hands of the shop manager. In the second case, the testing will need to be done by a specially trained staff who should not be under the shop manager's control; they should form part of the technical staff and should have full authority to check manufacture in any of the above two sections. With regard to the final examination, as every tire must be examined, it is advisable to place this examination under the control of the manager of the finished stocks department, who should keep the production manager in touch with daily defects.

At all times, judgment must be exercised to keep the cost of testing and examining as low as economically possible. Where a particular defect becomes excessive, care must be taken to avoid panic; where a special examination is instituted, this should be removed as soon as it has served its purpose.

Continuous Manufacture

of

Bed Sheets, Bathing Caps, and Baby Pants from Sheet

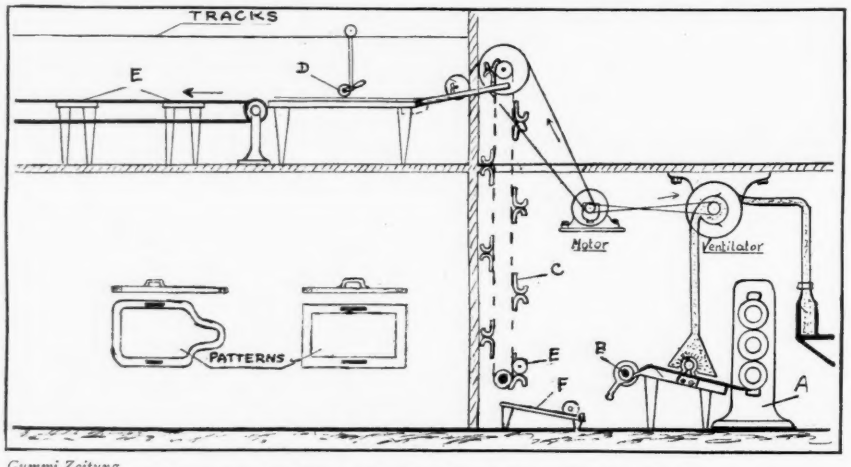
THE larger rubber factories in Germany have for a long time manufactured goods by continuous production processes which are based on time studies. Such processes are applied directly at the machines or in any other suitable place to give the maximum production. This development has caused anxiety among the smaller manufacturers whose capital will not allow them to install machines or effect expensive plant alterations. Such small works, if they are to continue, must inevitably follow the example of the larger companies and prepare to make goods by the continuous process.

The following outline indicates one type of continuous production that can be adopted at small expense by rubber manufacturers seeking to install continuous production of goods made from light calendered stock.

The following mixing is used for the manufacture of thin sheet goods to be cold cured, such as bed sheets, bathing caps, and baby pants: crepe rubber, 12; factice, 6; chalk, 0.2; oil, 0.15; colorings, 0.250. This stock must be absolutely clean, and after mixing on the mill and uniform heating, it is fed to the sheet calender.

This 3-roll calender, shown at *A* in the illustration, must have very smooth rolls, otherwise the least roughness will show on the sheet.

A metal-covered slanting-top table is located in front of the calender. As the sheet passes up this incline, it receives a dust coating of rice flour or corn starch distributed by a brush roller under the hood of an exhaust ventilating system. The latter surplus dust is conducted into a closed receptacle. The dusted sheet passes on and is wound up by hand or power on a shell *B*. The size of the rolled sheet is limited to twice the diameter of the shell on which it is wound. This provides against its sagging and stretching out of gage by its own weight and thus becoming unusable.



Gummi-Zeitung

Scheme for Continuous Production of Sheet Rubber Goods

The roll of dusted sheet is next placed on a vertical belt-elevator *C* which conveys it to an upper cutting and making-up room. Here it is automatically deposited at the head of an inclined plane, down which it rolls to the lower edge where it is caught by a device, *D*, movable on an overhead track. By this means the suspended roll is unwound in table-lengths by two operatives working either side of the table, who transfer the suspended roll back and forth as need be and cut the sheet to patterns, either by hand or power-cutting means. The cut stock is placed on a horizontal belt conveyer *E* and passed on to the operatives who assemble it into the respective articles of manufacture.

When a roll of sheet has been unwound, its shell is returned to the calender room by the belt conveyer *C* which automatically discharges it on an inclined table *F* adjacent to the calender ready for use. If this cycle is well executed, it becomes possible to operate the calender continuously at full capacity.

Correct Colors *for Rubber Goods*

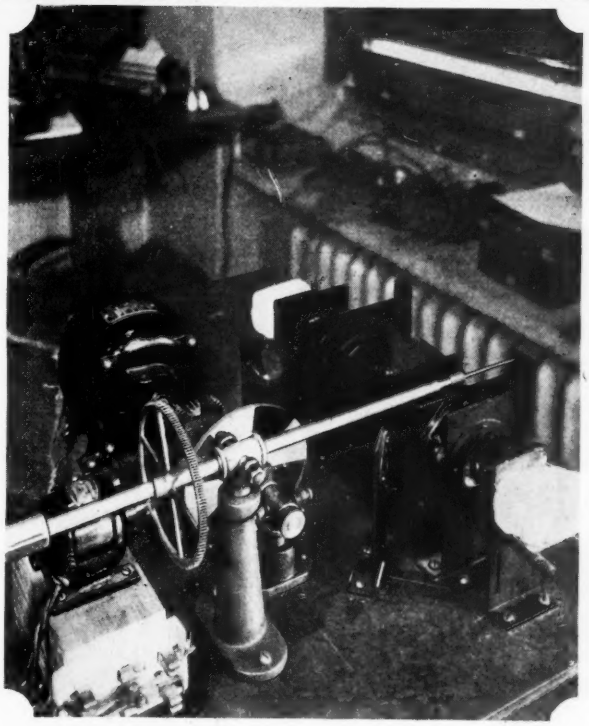
Prof. Arthur C. Hardy With the New Recording Color Analyzer

THE rubber industry is much interested in correctly matching colors of textiles used in rubber proofing, and equally interested in securing the proper colors for fine rubber goods. The importance of accurately matching shades and tints is obvious when rubber goods are highly colored.

It has always been a difficult problem to insure accurate matching of colors. Samples which in daylight might seem to be exactly alike in color will, under artificial light, be of entirely different shades. Even when viewed under the same light, two persons, because of differences in color perception of their eyes, will have different opinions as to whether or not the colors of a group of samples are alike.

In view of the difficulties experienced in color matching, there has been much interest in the announcement of the invention of a device known as the recording color analyzer by Prof. Arthur C. Hardy, of the physics department of Massachusetts Institute of Technology and of the staff of the research laboratory of the General Electric Co.

Human judgment, one of the most troublesome elements in the usual methods of color analysis, is entirely eliminated by this device which automatically, rapidly, and precisely measures and



Close-up of Laboratory Apparatus, Showing Color Specimen (front), Magnesium Carbonate Color Standard (rear), Light Source, and Analyzing Disk

records the color and wavelengths of any substance.

Just as ordinary white light, or sunlight, is broken up into rainbow colors if passed through a triangular prism, so colored light is broken up by the prism into bands of different wavelengths and colors, with some colors more prominent than others. A pure color would have a minimum number of lines, but most of the colors as we know them are far from pure—they are mixtures of various wavelengths. That is the reason why some colors which seem to be alike in sunlight differ so much from each other when viewed by artificial light. The prism will show that a sample of a certain green dye contains a little of every color, a decided proportion of red, and a maximum of bluish green, green, and yellowish green.

One of the interesting exhibits in connection with this recording color analyzer is a card containing samples of three pieces of black cloth. All look alike in daylight, and it might seem that there would be no real reason for using dye No. 1, costing more than twice as much as either of the others. Under artificial lights, however, there is a decided difference. Specimen No. 1 remains black, No. 2 becomes greenish, and No. 3 assumes a rusty tinge. Analysis shows that No. 1 is a true black, No. 2 has too much green in its curve, and that No. 3 has the same fault in the red region.

The new color analyzer, a combination of a powerful optical system and electrical devices, automatically analyzes the spectrum of colors and makes a chart of the analysis. A specimen, the color of which is to be analyzed, is placed in a holder and illuminated by a special ribbon filament incandescent lamp. Magnesium carbonate, the standard of whiteness, is similarly adjusted on the opposite side of the lamp. The light from the lamp falls perpendicularly on both the specimen and the magnesium carbonate standard, and enters the slit of an ordinary spectrograph system after reflection from both sample and standard.

Immediately in front of the slit is a rotating disk with alternate transparent and silvered segments, so located that light from the standard enters the slit when a transparent segment is in the beam, and light from the specimen when a silvered segment is in the beam. The light is dispersed by the spectrograph system, and the proper wave-length band selected by a second slit.

Monochromatic, or single wave-length, light is then received by the photoelectric cell back of the second slit. This light, as received by the cell, pulsates when different amounts of light in that region of the spectrum are reflected by the sample and the standard. This pulsating light is changed by the photoelectric cell to a pulsating electric current, which is then amplified 10,000,000,000 times and employed to run a small motor. This motor actuates a shutter in the beam between the light source and the standard, automatically adjusting the shutter to that point at which the pulsations in the current cease. This position is independent of the characteristics of the photoelectric cell.

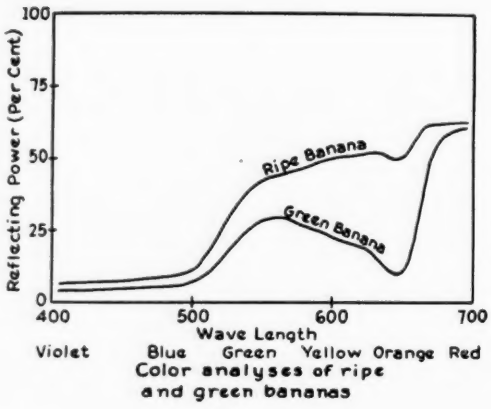
The reflecting power of the specimen is then recorded on a rotating drum by a pen attached to the mechanism controlling the shutter just mentioned. A second motor simultaneously rotates the drum and drives the slit across the spectrum, thus giving a complete color analysis in a time which has been reduced recently to less than a minute. In other words, no more time is now required for a color analysis than for the measurement of some of the simplest physical properties.

The introduction of organic accelerators and organic rubber colors which maintain their color values in low temperature vulcanization has greatly extended the acceptability of rubber goods for many purposes and made desirable the quick and accurate standardization of the color effects.

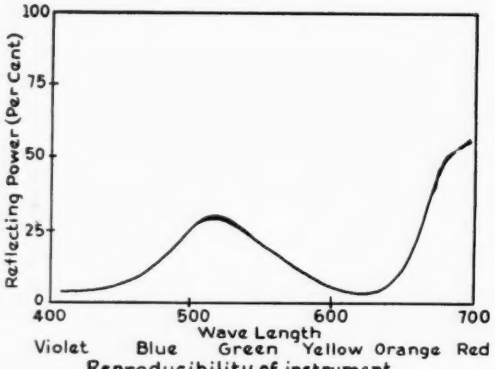
In whatever branch of industry the color of a product is a factor, the new recording color analyzer will be of service. In the textile industry accurate measurement of color is of utmost importance, especially when considering delicate shades which easily deceive the eye. Similarly manufacturers of raincoats and pure gum colored novelties will be interested.

In the sale of plantation rubber the price is affected by difference in color of the sheets.

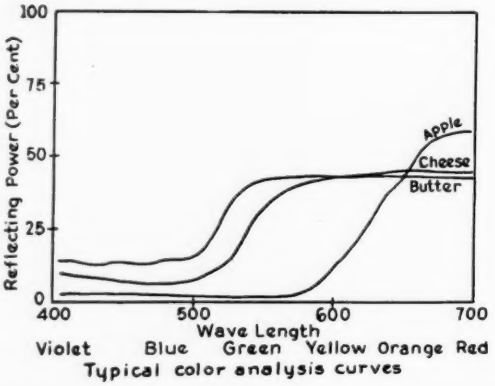
The elapsed time since Professor Hardy's instrument was developed has not been sufficient to have permitted the testing of its applicability to all of the industries in which it is expected to be of service, but a sufficient number of tests have been made with the experimental device to indicate that the problem of rapid and accurate color analyses has been solved. The development of a commercial model of this device is progressing satisfactorily, and it is expected that it will be perfected and available for the market in approximately six months.



Color analyses of ripe and green bananas



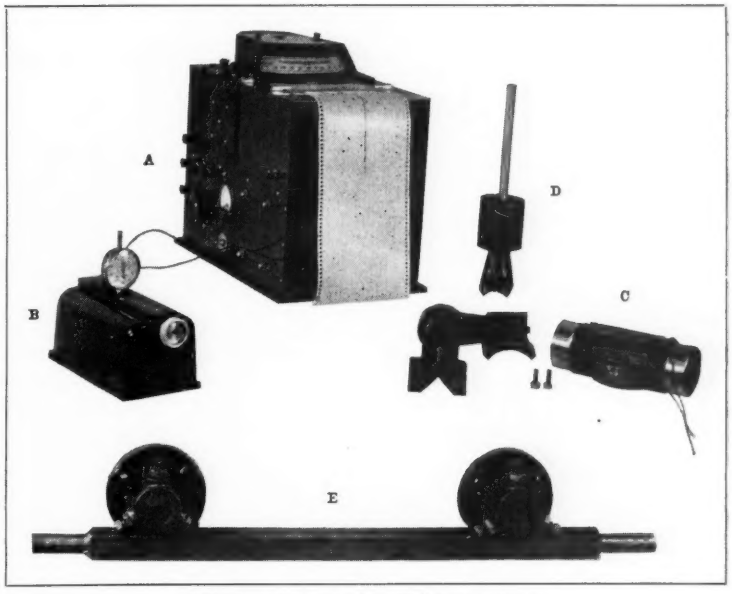
Reproducibility of instrument, showing two curves, practically superimposed, of specimen of green silk.



Typical color analysis curves

Magnetic Thickness Gage

A Modern Means for Gaging Accurately and Recording Continuously the Thickness of Calendered Rubber



Schuster Autographic Thickness Gage

A. AUTOGRAPHIC INDICATOR. B. GAGE SETTING INSTRUMENT. C. MAGNETIC CARRIAGE. D. CARRIAGE ATTACHMENTS. E. CARRIAGE BAR AND CALENDER ATTACHMENTS.

CORRECT gaging of calendered stock is essential for economical operation of the calender room and production of stock to coincide with specifications on which the cost and quality of goods are based. This problem was recognized long ago by rubber goods manufacturers but was not solved scientifically until the magnitude of the losses consequent on the enormous output of calendered stock produced in modern tire plants was keenly realized in competitive tire production.

The familiar Birmingham wire gage was the ready-at-hand tool of all the early rubber workers. This simple template gage is adapted for sizing wires and sheet metal in definite thickness but is valueless for gaging yielding materials such as uncured rubber because it is not adjustable and the gage intervals are arbitrary and erratic. It was originally adopted by rubber workers solely because it was a handy pocket-tool, the only type of gage then available and its inflexibility was roughly compensated for by specifying stock to be run to a given gage number "light" or "heavy."

It is surprising how long this gage was in universal vogue in rubber work. It was superseded in the more progressive rubber footwear factories less than 40 years ago by the introduction of a spring micrometer gage conveniently located at the calender and indicating thicknesses from 0 to .360 of an inch by intervals of 0.0025. This gage was soon followed by a portable spring gage of ½-inch range reading by 0.010-inch. When readings by 0.001 were required, resort was had to the well-known screw micrometer with broad contact surfaces. This form is still in use because it is portable, durable, and accurate.

Other lever-operated spring gages reading to 0.001-inch on the dial have been in vogue for a long time. However, none of these successors to the Birmingham wire gage were capable of indicating the thickness of stock except in spots on cut samples or across the ends of a roll. Thus in the progress of calender production their suitability is limited to isolated gaging only and their indications are approximations read only by the observer.

The solution of accurate and continuous gaging across the calendered sheet in motion and with automatic record came with the introduction of electric or magnetic apparatus built to meet the specific conditions of calendering non-magnetic material either stationary or in motion at all speeds.

This gaging device, shown in the accompanying illustration, is applied and operated in the following manner:

The gaging outfit consists of three units. First, a recording meter panel, A, of the zero center type reading from 0 to 5 both to right and left of zero. Second, a setting device, B, with a dial similar to the standard hand-gage used in most rubber factories. Third, a magnet carriage, C. This is a specially designed electro magnet supported between two special steel rollers held in fittings, D, slidably mounted on bar, E. The latter is mounted across the calender frame in fittings to which it is journaled at each end.

The rollers rest upon the stock while it is on the calender roll and can be placed either upon the finished stock, on the pulley, or stock cooling drum. Any movement of this magnet carriage closer to or farther away from the calender roll, idler, or drum, will instantly be indicated on the meter, .0001 of an inch, either thin or thick as the case may be. Inasmuch as the only thing that can possibly change the relative position of the magnet carriage and the calender roll is a change in the thickness of the stock, indications shown on the meter are actual changes in stock thickness. Changes in compounds will have no effect upon the meter as the instrument indicates thickness only.

When the gage has been mounted on the calender and the magnets adjusted to read directly in one thousandth of an inch, the next operation is calibration. This is accomplished by running one roll of stock using the old method of gaging, adjusting the dial on the setting device to bring the indicating hand to zero when the stock is running correctly under the old method of gaging. This roll should then be weighed. If the weight shows heavy, the reading on the setting device should be lowered and if the weight shows light, the reading should be raised and another roll of stock be calendered with the indicating needle at zero and the weight of this roll taken. When the correct setting is thus found, it should be tabulated and posted conveniently to the setting device and always be used for the corresponding gage stock. This procedure is followed out on all gages to ascertain their corresponding new gage settings.

To control the gage of the stock after calibration, the

indicating needle should be held on zero by adjustment of the temperature of the stock, or by raising or lowering the upper calender roll after the lower roll is set. Noting the indicating needle, as gum feeds are thrown in from different mills, will show which one is milling the stock much hotter than the other, thereby causing variations in gage of the stock calendered.

By sliding the magnet carriage from one side of the calender to the other, one can keep an even coating of gum from edge to edge of the fabric. The needle on the milliammeter should always be kept at 300, thus taking care of any voltage fluctuations. This adjustment is made by turning the small rheostat at its left in A. Because the instrument reads *space* not mechanical *motion*, it is not affected by eccentric rolls or even the most excessive vibration.

To use the gage the operator adjusts the setting device, C, so that the hand on its dial points to the thickness required, for example 15/1000. He allows the rollers of the magnet carriage to rest upon the calender roll and starts the calender, the stock passing under the magnetic carriage rollers. He then adjusts the calender rolls to the point where the index of the large meter A rests at zero. When that is done, the stock is 15/1000 thick. No gage cuts are necessary. All that the operator needs do to insure perfect gage is to keep the hand at zero. Any deflection of this either to left or right of zero shows in tenths of thousandths of an inch that the stock is running thin or thick. The calender is then adjusted accordingly.

It is noteworthy that this gage meets with prompt acceptance by calender operators because it is both accurate and rugged. They recognize at once the great saving in scrap that its use will make on their shift. Also no chances need be taken with stock conditions because gage cuts are eliminated and accurate indications are given continuously throughout the run.

The instrument is connected to the regular 110 volt A. C. lighting circuit and requires only 100 watts for its operation. The meter pictured at A in the illustration automatically registers the gages of the stock being calendered. This is a valuable feature where a performance record is desired for costing or other purposes. Where permanent records are not required, an indicating meter is substituted for the autographic form.

With this gage tolerances can be cut much closer. When applied to a four-roll calender, a correct skim coating can be secured on each side of the fabric. Before this application some manufacturers secured a fairly even weight per square yard but had great difficulty in securing even distribution of the skim. It is found that the use of this gage permits reducing tolerances much closer than formerly, that no sheets of gum or fabric will be calendered over weight, with marked improvement in quality of work and economy of material.

Data and illustration were supplied by P. B. Schuster, president, The Magnetic Gauge Co., Akron, O.

Rubber Linoleum and Factice

A tacky product suitable for making linoleum is said to be made by heating rubber and linseed, rapeseed, or mineral cylinder oil with such salts as cobalt linoleate or potassium cyanide in vacuum at 300-350° C. The process is claimed to modify the viscosity and other physical properties of isocolloids. In the latter class are listed rubber, fatty oils, resins, mineral oil fractions of high boiling point tar, asphalt, styroline, etc. Isocolloids are defined as colloidal substances in which the dispersed phase and the dispersion medium are both of the same chemical composition but in a different physical state. With other chemical treatment other isocolloidal products may be obtained, it is claimed, such as rubber substitutes, etc.

Will Front Drive Save Tires?

The advent of a front-drive automobile, in which power is applied directly to the wheels at either side of the motor, instead of to the rear wheels, starts a new line of discussion as to the effect of such a radical change on tire service. In the familiar type of motor-car the front wheels ordinarily roll along while supporting the forward part of the vehicle. The rear wheels, however, must not only support the back end of the car, but must also grip the road surface in order to push or pull the car in forward or reverse motion. In securing needed traction, tires in the latter position can easily wear more than those on the front wheels. With conditions reversed, the tires on front-drive cars would have to withstand the abrasive traction strain and hence would be expected to wear faster than the rear tires, which are correspondingly relieved.

Champions of the new type of drive claim that, in addition to giving higher speed with less power and affording certain constructional advantages, front-end direct propulsion will not cause quite so much tread wear on front tires as is now sustained by rear tires, which must get power through the long-drive shaft with its universal and differential hook-up; and that total wear on all tires will be even less than on rear-driven cars. Makers of the latter dispute this claim, contending that the additional strain signifies little else than simple transference of excess wear from back to front, and can result in no appreciable all-around tire saving. At any rate, tire makers, engineers, and consumers will watch this new car with unusual interest.

Thin Inflatable Articles

It is very difficult to produce thin-walled inflatable articles such as toy balloons and representations of animals so that when inflated, the desired solid shape is attained. Thus, inflatable doll heads could never be produced by dipping, even with the use of accurate molds, so that, on inflation, the shape of the mold was exactly reproduced.

Articles produced from thin rubber sheets by die-stamp welding are largely restricted as to exact shape owing to the small number and the flat shape of the rubber sheets forming the article. Such inflatable articles are sensible to damage, even a pin prick being usually sufficient to cause the air to escape, producing a hole that makes the article useless.

Thin-walled articles made according to the present invention[1] are free from these disadvantages and consist of one or more layers of extensible rubber and of one or more flexible, lacquer-like, insoluble layers composed of cellulose derivatives. The layers adhere to and reduce the stretching of the rubber layers by at least one half.

For example, representations of animals produced from two or more thin rubber sheets by die-stamp welding can be transformed into articles in accord with the invention by coating their outer surfaces with a lacquer of such thickness as to restrict the stretching to the necessary extent. This ensures the article against bursting on excessive inflation because the lacquer layer is practically unstretchable.

The desired property of greater rigidity may be attained in such degree that although the article is stretchable, the inflated figure retains its shape even after the positive pressure has been relieved. Thus the image of a standing inflated animal will remain standing without altering its shape, yet it can be deflated by being pressed together.

The modifications included in the invention permit ornamentation by adhesion to the lacquer layer of long and short hairs, fibers, luminous powder, etc., also making molded combinations of celluloid and dipped rubber articles.

[1] U. S. Patent No. 1,713,751, May 21, 1929.

The Manufacture of Belting

JOSEPH ROSSMAN

A review of the United States methods and apparatus patents for manufacturing laminated belts made by cohering layers united chiefly by rubber.

RUBBER belting is made by uniting two or more layers of duck, canvas, or other fabric by means of rubber and vulcanizing the assembly to form an integral structure. It is manufactured in widths ranging from one inch to sixty inches and from two to twelve plies thick. Rubber belting is used for transmitting power in machinery and also for conveyers. It may be obtained in lengths of any desired dimensions as well as in endless form. The ability to manufacture rubber belting in unlimited length without jointing is one of its great advantages over leather belting. The modern processes produce rubber belting of uniform width and thickness which can withstand extremes of heat and cold. Rubber belting is silent in operation. It is elastic, durable, adheres well to the pulleys, and transmits power efficiently.

At first rubber belting was made entirely by hand, the canvas or duck after being covered with an adhesive mixture being folded together and rolled or rubbed down. This process was tedious and expensive. The belting was liable to be blistered during the process of vulcanization by the air bubbles which it was found impossible to remove entirely from between the folds. It could not be made of uniform width by hand. Machines, such as disclosed in U. S. Patent No. 17,216, May 5, 1857, were therefore developed to carry out this process mechanically, eliminating many of the objections inherent in the manual process. Today, all the operations in producing belting are performed with exactitude and precision by highly developed machinery.

The rubber belting made up of plies of duck and vulcanized rubber was at first put on the market without any stretching operation. Appliances were used for taking out the stretch by subjecting the vulcanized belting to a heavy strain. The stretching process materially injured the rubber belting by altering the relation of the threads of the duck to the vulcanized rubber in which they were embedded, and also by the elongation of the rubber portions of the belt. When a rubber belt is stretched after it is completely formed, and either wholly or partially vulcanized, the rubber is so little plastic, even when heated, that the motion of the threads of the duck, necessarily incident to the elongation of the belt, impairs the adhesion of the rubber to the threads, and also weakens the cohesion of the rubber particles to each other. Moreover, it is practically impossible to take out all the stretch which should be taken out without tearing or otherwise visibly damaging the belt.

It was then proposed by Haley in U. S. Patent No. 271,629, Feb. 6, 1883, to stretch the finished belt before it was vulcanized. When stretched green, the belt can be readily elongated enough to take out all the stretch, which is practically impossible when the belt is stretched after the rubber compound has been vulcanized. Moreover, the motion of the threads of the fibrous material of the belt, caused by elongating the belt when green, tends to make them take a more intimate and closer hold upon the plastic rubber compound by which they are surrounded, and as the rubber compound is plastic, it is not injuriously affected by elongating it.

A large number of patents utilize the prestretching operation with various modifications in order to produce a belt which will not stretch in service.

Conveyer belts have been utilized a great deal in industry for the efficient handling of materials. They are very useful where a constant flow of materials is desired whether it consists of light articles such as cans or heavy materials such as cement, coal, and ore. These belts must withstand great strain and have the same characteristics that power belts possess, such as pliability, durability, and resistance to moisture. These qualities are especially necessary for belting used in the quarry, mine, and grain industries. The process of making conveyer belting is essentially the same as that used in making belting for power purposes, and several special processes have been patented.

The manufacture of endless belts has received recently considerable attention by inventors. Endless belts have been made by cutting a suitable fabric into long strips in suitable lengths and widths, and thereafter joining the ends to make the belt continuous in various ways—such, for instance, as overlapping and cementing, sewing, lacing, and otherwise; but belts thus made have been very unsatisfactory owing to the impossibility of securing at the same time a smooth uniform union and the required durability. Endless fabric belts have also been made by first forming an annular band of warp-thread or skeleton of the belt of the desired width and thereafter weaving in the weft-web or filling transversely of the warp, commencing at any given point and weaving around longitudinally of the belt until the starting point has been reached. In carrying out this method, a loom is usually employed to weave the greater part of the filling of the belt. Endless belts have been produced by winding rubberized cords on a support or by covering a drum with fabric and rolling it up to form an endless belt.

Another method which has recently been developed consists in forming a long cylindrical belt member and after vulcanization cutting this member into narrow belts. This process is particularly adapted for making automobile fan belts. The detailed process is given in U. S. Patent No. 1,281,153 to Gates as follows: The process consists first in cutting strips of the proper width from woven rubberized fabric so that the warp and woof extend diagonally of or form oblique angles with the length of the sheet of fabric. It is ordinarily necessary to cut a series of strips from a sheet of the rubberized fabric, the cuts extending diagonally to the direction of the length of the normal sheet, and afterward connecting these strips to form a relatively long sheet whose warp and woof are diagonally arranged to the direction of the length of the sheet. This sheet is first wound into a roll of convenient size and upon a shaft or drum from

which it can be conveniently unwound for belt-forming purposes. The core upon which the belt is formed is preferably composed of a hollow collapsible cylinder which is mounted in a lathe and rotated in order to form the relatively long cylindrical belt member.

Assuming that the cylindrical core is in place, one end of the sheet of rubberized fabric, whose warp and woof are diagonal to the direction of its length, is applied to the cylinder through the medium of a strip of raw gum or other suitable vulcanizable material, the end edge of the sheet covering only a part of the strip of gum. The cylindrical core is then rotated, and after the first convolution is completed, it will be understood that the rubberized fabric adjacent the starting edge also engages a portion of the gum, thus completely sealing the first convolution after vulcanization is complete. The rotation of the cylinder is continued until the desired number of layers or thicknesses of the rubberized fabric are arranged in superposed relation to produce a belt of the proper thickness. The sheet of fabric is then severed and another strip of raw gum or vulcanizable material applied to the outer edge of the sheet of fabric and allowed to overlap the adjacent body-portion of the belt member. The cylindrical core with its belt member thereon is then tightly covered exteriorly by winding thereon a layer of suitable canvas which forms a covering for the cylindrical belt member.

The cylindrical core is then removed from the lathe and placed within the vulcanizer where it is left the required length of time to properly cure it. The core with its belt member is then removed from the vulcanizer and placed in the lathe, after which the canvas covering is removed therefrom by an unwinding operation. The belt member is then cut into a series of belts of the desired width, through the instrumentality of suitable cutting mechanism. After this is done, the cylindrical core and the belts carried thereby are removed from the lathe and the core collapsed, after which the belts will slip therefrom in an endwise direction.

Endless V-belts are also produced by a similar process on a drum having grooves for receiving the belt material as in U. S. Patent No. 1,354,738. V-belts have also been made from a long cylindrical blank by cutting the blank into complemental rings of trapezoidal section so that no material is wasted.

The following abstracts of U. S. Patents give a chronological summary of the belt-making machines and processes.

1. Hale, 17,216. May 5, 1857. A machine for making two-ply belt in which a single strip of duck is employed of double the width of the intended belt. This strip is folded over an equal amount upon each side, the two edges meeting in the center and there forming a joint which is sealed with a strip of rubber.

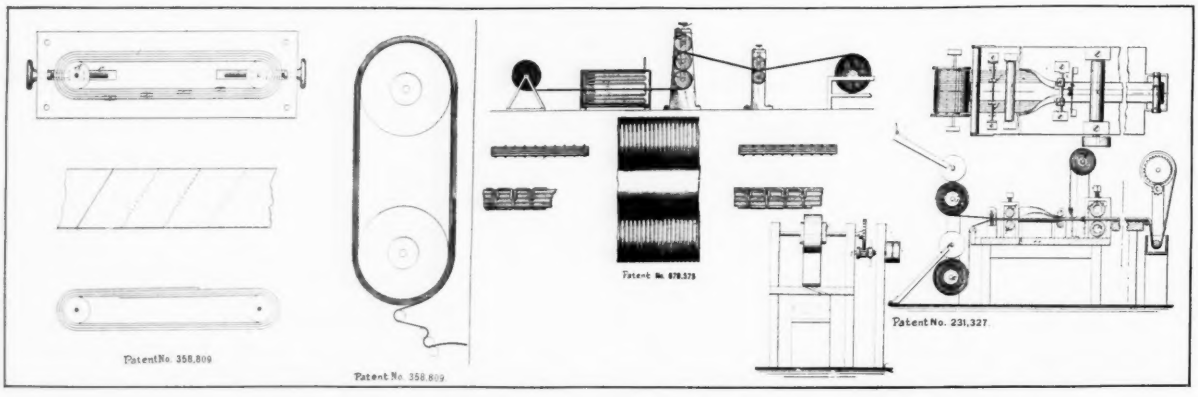
2. Mayall, 26,603. Dec. 27, 1859. A process for making belting which comprises bringing the two edges of the outer sheet or covering evenly together to form a true and perfect joint and completing the formation of the belt or band, by the employment of two or more rollers arranged in relation to each other so that the belt or band shall be drawn partially around the periphery of either or all the rollers.

3. Mayall, 27,001. Jan. 31, 1860. Belting consisting of a solid woven fabric without seams coated or covered on one or both sides with rubber or gutta percha, by frictioning the fabric on a calender. The superfluous rubber is then cut off by two cutters adjustable laterally so as to be adapted to different widths of belts.

4. Mayall, 27,730. Apr. 3, 1860. A process of forming a series of machine belts at one operation consisting in rolling two or more sheets of rubber sufficiently wide to form two or more belts at a time upon strips of fabric that compose the inner body of the belts, and then nipping the sheets together, and cutting them into separate belts.

5. Dodge, 61,173. Jan. 15, 1867. A strip of rubber-coated cotton duck is completely covered by another strip of fabric of double width by means of a folding horn and presser rollers.

6. Mayall, 157,921. Dec. 22, 1874. A machine for making combined canvas and rubber belting, the combination of a folding mechanism which folds the canvas into two or more thicknesses, a rubber-applying mechanism which envelops the folded canvas in a sheath of rubber, and pressure rolls which unite and consolidate the canvas and rubber.



7. Baster et al, 173,437. Feb. 15, 1876. A rubber-belting machine having folding horns and presser rollers. The folding mechanism has a convexed surface on the side opposite the seam so that when the edges are brought together there is more stock on the steam side than on the other side of the belt. A pricking roller is provided for pricking the flat surface of the belt to allow the escape of air.

8. Gandy, 228,186. June 1, 1880. The method of making the belt consists: first, of folding the canvas upon the line of its warp, either in a machine or by hand, to the thickness desired; second, of stitching it upon the line of its warp with as many rows of stitching as may be necessary to thoroughly unite the folds or plies of canvas, the stitching being done while the belt is under tension between a holder and a pair of feed rollers; third, of pressing the belt in a series of calender rolls until its surface is flat and even, and the several folds or plies of canvas are forced hard upon each other; fourth, of stretching the belt in the operation of pressing it until its tensile elasticity is practically exhausted and the liability of the belt to stretch in use is removed.

9. Joslin, 231,327. Aug. 17, 1880. A machine for making rubber belting consisting of guides for the stock, pressure

roller, folding shoe, rollers for pressing the folded edge, guide for the seam strip, and calender rolls, combined together and with delivery and take-up rolls.

10. Paton, 247,102. Sept. 13, 1881. The method of making a belt which consists of first plaiting together the twisted fibrous yarn to the desired breadth and thickness, then washing it in alkali or hot water, then treating it with tannin or other astringent, then filling its interstices with linseed oil or other suitable plastic and elastic substances, then stretching and pressing it hard and even.

11. Gandy, 250,800. Dec. 13, 1881. A method of folding the canvas and preparing the belt for the sewing machines consists of first passing a strip of canvas of the desired width through a former by which it is put in the form of a tube, then through a press gage and between a pair of pressing rollers by which it is pressed down in the form of a flat strip of double canvas having its edges joined in the center of one of its sides, then through a second gage by which it is formed in the shape of a V, then through a pair of pressing rollers by which the belt is completely folded, pressed, stretched, and finished for the sewing machine.

12. Ridgway, 253,428. Feb. 7, 1882. The invention consists in the combination, with the bed plate and grooved or flanged rollers, of open frames, sliding blocks, and screws, whereby each roller is adapted to have an independent adjustment.

13. Haley, 271,629. Feb. 6, 1883. The process of making belting which consists in first coating the woven fabric with rubber compound, then making up the coated fabric in the usual way, taking out the stretch, and then vulcanizing.

14. Haley, 271,630. Feb. 6, 1883. The process of making belting which consists in first coating the woven fabric with rubber compound, then making up the coated fabric in the usual way and stitching the plies together, then taking out the stretch, and vulcanizing.

15. Brown, 272,219. June 12, 1883. A mechanism for doubling and cementing fillets or belts consisting of a roller for applying the cement, a spreading bar or device for leveling off the surface and removing surplus cement, a pair of pressing rollers, and guides for separately directing the strips of material into the machine, and guiding them together between the pressing rollers.

16. Murphy, 284,221. Sept. 4, 1883. The method of manufacturing vulcanized belting containing several layers of fibrous material, which consists in uniting the layers by a series of flexible stays disconnected from each other at frequent intervals and applied before vulcanization.

17. Jones et al, 302,204. July 15, 1884. The process of manufacturing belting, which consists in sewing ropes, stretched straight and placed side by side, to a backing of ordinary belting material, rolling it flat between rollers, and rubbing with adhesive material.

18. Murphy, 355,834. Jan. 11, 1887. A thin rubber-coated fabric is applied to the edges of the inner fabric of the belting and the whole is covered with a coating of rubber, rolled, pressed, and vulcanized.

19. Gandy, 358,809. Mar. 1, 1887. The method of forming endless laminated belts which consists of wrapping a single ply of material around a former and fastening its ends together, then wrapping another ply of material around the last ply and fastening its ends together, and so on until the required thickness of belt is obtained, and fastening the several plies together, the joints of the several plies being at different points.

20. Plamondon and Palmer, 368,166. Aug. 9, 1887. Apparatus for manufacturing belting having folders which may be brought nearer together or moved wider apart, and the sides are at the same time kept equidistant from the center line of the table.

21. Emerson et al, 386,305. July 17, 1888. The method of manufacturing belting which consists in forming a metallic body by intersecting coiled sections of wire and elongating the links by passing it between rolls, then coating the surface of the body with rubber or its equivalent, then passing the coated body between heated metallic bodies under pressure, forcing the rubber into the interstices of the body, then applying canvas or rubber cloth to the surfaces of the filled body and again subjecting the whole to heat and pressure.

22. Midgley, 398,431. Feb. 26, 1889. The method of manufacturing wire belting which consists in forming a sheet or body by intertwining sections of coiled wire, then wrapping the body diagonally around a mandrel and securing the adjacent edges by a separate section of coiled wire, then heating the tube so formed and elongating the helices by subjecting the tube to longitudinal tension while heated, flattening the tube, and finally covering it with rubber.

23. Dick, 401,643. Apr. 16, 1889. The method of making composite flat belts or bands by first impregnating webs of canvas or other fabric with a solution of gutta percha, then subjecting the impregnated webs to heat, then folding the webs into belts or bands of the desired width, and applying to the belts or bands thus impregnated and folded elastic layers or sheets of gutta percha compound.

24. Gray, 575,424. Jan. 19, 1897. In the manufacture of coated-fabric belting for machinery, the combination of a rack supporting a number of rolls of coated fabric of equal width, and an additional roll of coated fabric about double the width of the others, a heated chamber through which the coated fabrics are passed as they are unwound from the rolls, a compound gage receiving and guiding the fabrics of equal width in one part thereof, and the wider fabric in another part, doubling rolls for uniting all of the fabrics together by adhesion of their surfaces, an additional heated chamber through which the united fabrics are passed, a die for turning the edges of the wider fabric around the edges of the narrower ones, and a pair of finishing rolls for applying a strip of material to the meeting edges of the wider fabric.

25. Collins, 641,841. Jan. 23, 1900. The process of making an endless woven power-transmission belt comprising a transverse section of seamless tubular fabric having substantially inelastic weft threads running circumferentially of the section in which the said section is folded or rolled to form a belt having a plurality of plies and the plies cemented together.

26. Landreth, 678,575. July 16, 1901. Canvas strips are folded longitudinally and stitched. The belt is impregnated with a suitable compound such as oil and stretched while hot after the heating and pressing operations.

(*To be continued*)

Export of Rubber Hose

The estimated number of pounds of rubber hose exported from the principal manufacturing countries for years beginning 1926, is shown below. United States statistics are official. French and Canadian figures are estimated; whereas, figures for Germany, Italy, Austria, and Belgium are reported quantities converted to pounds. Monthly figures for the United Kingdom, Italy, France, and Austria, are not available.

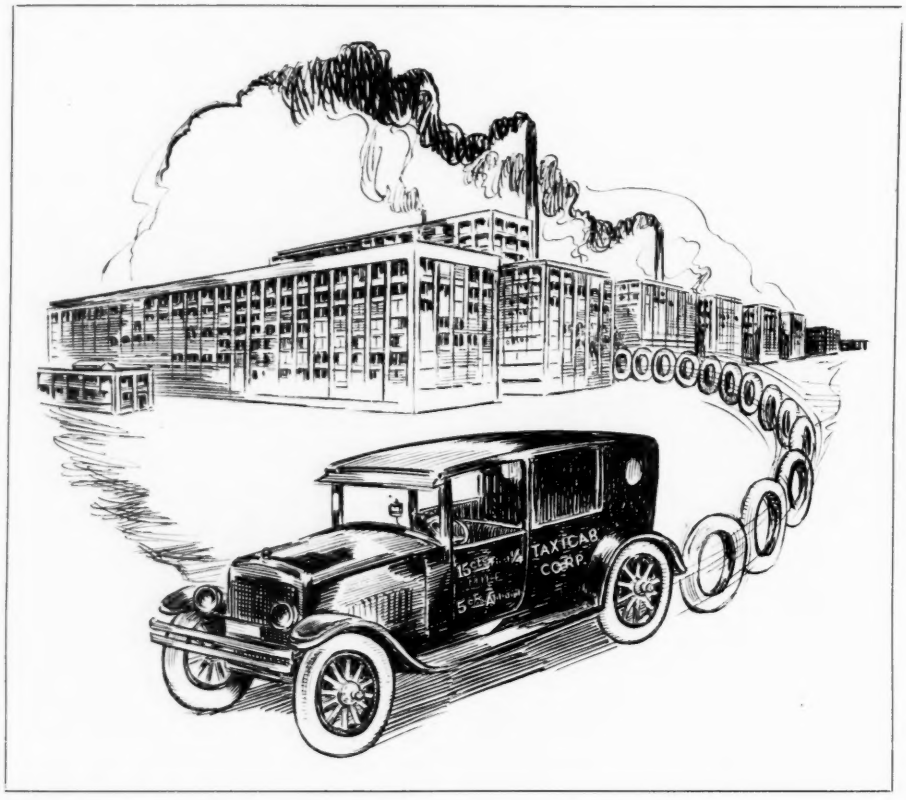
EXPORTS OF RUBBER HOSE FROM MANUFACTURING COUNTRIES

Thousands of Pounds

Year	United States	Germany	France	United Kingdom	Canada	Italy	Austria	Belgium
1926....	6,125	3,258	1,615	2,068	666	407	520	220
1927....	7,118	3,594	1,682	2,092	676	280	623	236
1928....	7,572	3,784	1,930	.....	714	306	...	329

Figures compiled by the Rubber Division, Department of Commerce.

Taxicabs *and* Tires



The United States Taxicab Industry Commands the Output of a Tire Plant Producing 2,000 Tires a Day

THE average person and few rubber manufacturers little realize that the taxicabs of New York City wear out daily 650 tires and a slightly greater number of inner tubes, or that the citizens and visitors spend daily for taxi fares more than $600,000 not including tips; yet a careful survey of this great auto industry shows these figures to be conservative.

The city of Greater New York has at present approximately 39,312 taxicabs registered, 30,000 of which are in daily service. A check-up to determine who gets the enormous sum of money therefrom, how it is spent, and who makes the greater profit brings to light a number of interesting facts and a mass of data that should be of interest not only to manufacturers of automobiles, tires, and accessories, but also to dealers in all those products and to those handling gasoline and oil as well.

The first noticeable fact is that the 39,312 cabs represent an investment of nearly $45,500,000, if we value one-third at the new-car price of approximately $2,000 each, one-third at about half or $1,000, and the remainder at $500 each; which is not far wrong as most of these cabs are replaced once a year or as soon as the last payment is made on them.

Classes of Owners

The next question is, who buys and operates these cabs, the percentage of the initial investment paid at the time of purchase, and the percentage that must be earned by the cab after it goes into service. Taxi operators may be placed in four classes as to their buying power, financing ability, etc.

First, is the individual cab owner who owns and drives his own cab, who incidentally makes the highest down payment and generally pays the top dollar for everything connected with his trade except his insurance in which he is classed as a better risk and gets an equal or sometimes a lower rate. Second, is the small fleet owner operating from five to twenty cabs, who gets some advantages on garage space, gasoline, accessories, and tires because of his ability to buy in quantities. Third comes the large fleet owner operating up to two hundred and sometimes more cabs, who owns his own garage, buys his gasoline and oil at quantity prices, and is

able to make much better contracts with tire and taximeter companies and accessory dealers, as well as new cab companies. Fourth and last, are the large cab companies who operate in some instances as many as 1,500 or 2,000 cabs and who deal direct with cab manufacturers, tire and taximeter companies, and use their quantity buying power to obtain the lowest prices at all times.

The last two classes own and operate approximately 30 per cent of the cabs on the streets of New York and buy new cabs every year or every time a new model makes its appearance; the theory being that the new and snappy cab is the best money-getter. The first two classes buy some new cabs but more often buy the trade-in cabs of the larger operator. In most cases these cabs are reconditioned and painted before being sold to the individual and small fleet owner.

Financial Operation

When the large operator finds that his fleet is paid up to the last two or three payments or a new type of cab appears on the market, he usually decides that it is time to get new cabs. He goes to the new cab company and makes arrangements to trade in a certain number of cabs at a price agreed upon, makes an additional cash payment, and gets the new fleet delivered in lots ranging from one to twenty cabs at a time, paying the balance of the purchase price in a series of monthly notes spread over a period of ten or twelve months.

He next goes to his tire company and contracts to have his cabs equipped with new tires and tubes on a rental basis; in very few instances does he use the tires and tubes with which cabs are equipped on delivery, the value of these tires and tubes being deducted from the purchase price of the cab and usually from the initial payment. This arrangement leaves him more cash for obtaining additional cabs and compels the cab to earn its own tire cost from the start. He then makes a similar arrangement with the taximeter company, registers the cab with the state motor vehicle and the city hack departments, takes out insurance bond, and his cab is ready for work.

The figures now stand something like this: the cab must book as a minimum $20, as a hack driver would say, four pound, divided as follows: chauffeur 40 per cent or $8, payment on notes $5, insurance $1, tires 81 cents, taximeter 50 cents, garage 75 cents, gas and oil $3, making a total of $19.06, showing that the greater portion of the money paid for cab fares is passed along to the new car company, the tire company, the insurance company, the garage man, and the gasoline and oil companies. He must always look for a certain number of cabs to book more than the minimum, and to discounts, etc., to realize any profits.

Those of the first classes who buy used cabs have a smaller investment per cab with a corresponding lower monthly payment, but the owner must pay more for gasoline and oil and a higher rate for tires and garage; so he is compelled to drive his own cab and look to his chauffeur's percentage and tips for his wages.

On the theory that the new and snappy-looking cab will get the most money, the makers of one of the popular cabs by skilfully using that as a sales argument were able to display a new model and book orders for upwards of 5,000 cabs over a period of about 30 days in the early part of last winter and at least thirty days before they were able to make delivery of a single cab. The same thing occurred with another make of cab six months previous to that, although on a somewhat smaller scale, and at the present writing it looks as though a third is in a fair way to repeat the success of its competitors.

If any one doubts that this competition has made a great improvement in appearance of the taxi on the streets of New York, it will only be necessary for him to spend five minutes on any corner on Broadway to convince himself that he can ride farther in the best-looking and most comfortable cab for less money than in any other city in the United States.

Plans of Purchase of Tires and Tubes

We now come to a question of more interest to the rubber industry: namely, tires and inner tubes, the number in use, the amount of service they give, who supplies them, and the various methods employed in selling them to the taxicab trade.

The large fleet owners without exception purchase their tires on what is known as a rental basis, in other words, they pay a specified amount for the service rendered, the tire company or dealer retaining title to all property rights in the tires and tubes, agreeing to keep cabs supplied at all times with serviceable tires and tubes mounted on the cab and inflated. The tire company assumes responsibility for losses due to any and all road hazards or any other losses except wilful destruction or those due to fire and theft.

Rental tires are sold to the cab trade by two methods. One is known as the mileage basis, where the operator pays a stated price per mile per cab, the tire company keeping each cab at all times equipped with four tires and tubes and spare tire and tube mounted and inflated to be carried with each cab; it also keeps the operator supplied with extra spares mounted on rims and inflated sufficient to allow him to operate continuously without interruption or inconvenience.

The second method known as "per day terms" has the same conditions as those on the mileage basis except that the operator pays a flat price per day for each cab irrespective of the number of miles run. This method has proven the more popular and with one notable exception is common practice today with the fleet owners and a number of individual owners; the price is from $1 per day for a single cab down to as low as 75 cents for some of the largest fleets.

It is noticeable that the individual cab owner is compelled to pay 25 per cent more for his tires than some of his wealthier competitors; so he usually elects to buy his tires outright and save this difference. But, as he very seldom has ready cash or wishes to make his cab earn its tire expense as it goes along, he buys his tires and tubes on what is known as the time-payment plan where he makes an initial payment of from 20 per cent to 25 per cent and spreads the balance over a series of weekly payments ranging from 10 to 16 weeks.

The greater part of this time-payment business is handled locally by the tire dealer, a number of them having been very successful with this class of business during the past year. Finance companies are willing to handle this business for 15 per cent, but one tire dealer who did quite a volume of business last year carried his own risk, and losses from bad accounts and cost of collecting were less than 8 per cent.

The bulk of the rental tire business is handled by the tire manufacturers direct, two of the well-known companies being noticeably active in this field at the present time. Up to quite recently one of the large tire manufacturers had pretty much of a monopoly on this class of business and was able to discourage the few feeble attempts of smaller companies to break in, but in the past few months another of the largest tire companies has made quite heavy inroads, and business seems in a fair way to be distributed between two or three of the larger companies with some of the smaller companies handling a small percentage of it.

Service of Tires

We now come to the question of service rendered by the tires as to the mileage, length of service, cost of repairing and servicing. It will be readily seen when we consider

the per day price received by the tire company that it is necessary for them to get the maximum number of days in order to receive value for the tires and tubes and make a profit. On the other hand with competition keen and various tire companies bidding for the business, the operator will be satisfied with nothing but the best; therefore, the question of service becomes of vital importance. It is said that one company, who had in the past been quite successful, recently completely reorganized its service department as it suffered some from competition and was unable to attribute its losses to any other cause than that its competitors had developed a better service. For example: operators refuse to run tires after they have worn smooth although there may be considerable mileage left on the tread and the carcass may be perfectly sound.

This has revived the practice of retreading which is being done quite successfully in some cases, giving additional mileage of 12,000, to 15,000 miles. Some of this retreading is done at the factory and at least one company has a small retreading plant attached to its repair shop in New York. From fairly reliable information it is learned that the best makes of tires give an average service of approximately six months and that ⅖ of 1 per cent go flat daily, meaning that this percentage of tubes must be repaired every day, while about 1/20 of 1 per cent of all tires running on the ground are repaired daily.

Tire Repairing

Here again we see a marked difference in methods of repairing both tubes and casings than practiced in the average repair shop to which the motorist is accustomed to go for his repairs, as the object here is to get the maximum amount of service for the amount of money spent. The repair departments have developed methods where most substantial work can be accomplished with a minimum amount of material and labor. No cold patches are used on inner tubes, all punctures being repaired with vulcanized patches. For this work hot plates are used similar to the old-time steam plate, the difference being instead of using a boiler and circulating steam through the plates the cavities of the plates are filled with paraffin and a gas-burner is placed underneath the plate. This arrangement not only saves space but allows the plates to be brought up to vulcanizing temperatures much quicker and does away entirely with the care of boilers, and, as there is no loss of paraffin by evaporation, it is not necessary to refill plates more often than every twelve months. This same idea is carried out throughout the vulcanizing equipment used in the repair shop.

Spot and Boot Repair

Tire repairs are principally necessitated by glass cuts, punctures, and stone bruises, the repair being made by the spot and boot method in which very little new material is used and no part of the casing is torn down but simply skived around the edges of the hole made by the puncture or cut on the inside of the casing to prevent flexing; then it is buffed and cemented and a patch or boot which has been cut from a worn-out casing inserted. The outside cut is filled with uncured repair stock and the whole vulcanized at one cure. This method is said to be not only the most economical but also more substantial than any other used. These boots and patches are supplied the repair shop by their factories from worn-out casings and are in various sizes and of different number of plies to meet the requirement of different types of injuries and different sizes of tires. These come from the factory with the edges skived and ready for use and as machinery has been developed for preparing this patch, they can be furnished in bulk for a fraction of the cost of new material. It is claimed that tire repairs can be made by this method for about 25 per cent of the prices usually charged by the commercial shop.

Collecting Flat Tires

The collecting of flat tires from the fleet owner's garage and returning them has been a subject of considerable rivalry between the service departments of the different companies, as all these cabs operate two shifts and changes are made between 5:00 and 7:00 A. M. and 4:00 and 6:00 P. M. It is necessary to make both collection and delivery between these hours. The additional spares before referred to are used at the morning change to allow each cab to go out with full equipment of tires, but the afternoon shift depends upon the tires returned from the tire company, and the service manager must stand for considerable abuse if he fails to make his deliveries later than 3:30 P. M. One company is now using five trucks in this service.

As mentioned at the beginning, those 30,000 New York cabs in daily service wear out approximately 240,000 tires each year, based on the assumption that each cab has four tires on the ground at all times and that the average life of the tire is six months. This would give each cab eight tires a year, and, as cabs run 365 days, this would give a daily average of 657 plus tires worn out. Of course not every cab wears out two sets of tires, but on the other hand some of the individual owners use a cheaper grade of tires which do not last so well. This together with tires spoiled by accidents and prematurely by misalinement and other causes will bring the average up to the above figure.

Owners' Associations

In conclusion we might say a few words about cab owners' organizations. In New York there are two groups: the fleet owner's organization and the individual owner's association. The fleet owner's organization has been successful notably in one instance where an organization composed principally of the smaller fleet owners banded together and were able to buy collectively everything, gasoline, oil, tires, and garage space on an equal basis with the largest fleet operator.

The individual owner's association has made most of its progress toward lower insurance, one such organization numbering nearly 2,000 members who carry their own insurance risk and at present enjoy the lowest rate of any cab men in the city. At the present writing the fleet owners are advocating an increase in taxi fares while the individual organization is asking for a reduction, as they can operate cheaper than the fleet owner. They hope to drive a number of them off the streets with a lower fare.

Export of Rubber and Balata Belting

The estimated number of pounds of rubber and balata belting exported from the principal manufacturing countries for years beginning 1924 is shown below, all numbers being in thousands of pounds. United States statistics are official and beginning with January, 1928, contain shipments to noncontiguous territories. Canadian figures are as officially reported. The figures for the United Kingdom, including balata and rubber belting, were converted to pounds from hundredweight; Germany, Norway, Belgium, and Czechoslovakia reported weight in kilos converted to pounds.

ESTIMATED EXPORTS OF RUBBER AND BALATA BELTING FROM MANUFACTURING COUNTRIES

Thousands of Pounds

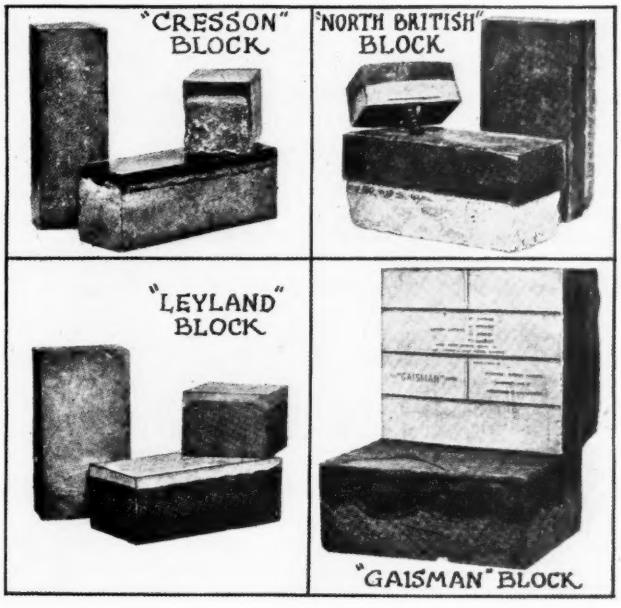
Year	United States	Canada	United Kingdom	Germany	Norway	Belgium	Czecho-slovakia	Total
1924....	3,572	702	2,659	528	250	425	525	8,661
1925....	4,079	1,213	2,881	703	333	352	156	9,717
1926....	4,173	1,149	2,658	729	343	348	306	9,706
1927....	5,010	1,227	2,544	974	428	300	335	10,788
1928....	4,958	1,225	3,165	1,029	392	301	306	11,376

Compiled by Rubber Division, Department of Commerce.

British Rubber Paving

Interest in Resilient Road Surfacing Said To Be Growing in England—Highway Engineer's Report on Critical Tests Encourages Advocates—Principal Types of Blocks Described

APPARENTLY it takes more than a rise in crude rubber prices to dampen the enthusiasm of the champions of rubber paving, especially in England, where most of the experimenting with rubber paving materials has been long and painstakingly conducted. There the merits of some forms of rubber paving material have been strikingly demonstrated in many thoroughgoing trials, although there, as elsewhere, cost still remains the great obstacle to the adoption of such material on any large scale. Still, the champions are confident that even that objection will be overcome in the near future. As indicating a favorable trend, reference is made to the claims of two Dutch inventors[1] that efficient rubber paving blocks can be laid for less than $10 a square yard. Even this cost, it is said, may be reduced considerably through the use of a lighter block for thoroughfares with medium traffic, through a liberal use of reclaimed rubber and certain fillers, or through mass manufacturing. Then there is always the possibility of a rubber paving material being developed that will be even cheaper and yet as serviceable as any so far produced.



Typical British Paving Blocks

Since the underground explosions in a road in the Bloomsbury district of London last December, English interest has been more keenly focused than ever on rubber paving. As a result of the ignition of gas from leaky pipe joints considerable damage was done to roadway and buildings and many people were injured. The disaster, it is held, was due to long-continued vibrations at the surface of the street transmitted to the pipe joints which had allowed the gas under pressure to seep through minute outlets until it had accumulated in some cavities and required but a spark to cause much destruction. Rubber paving, it is contended, would have absorbed most of the vibration and doubtless have averted the explosion.

Rubber Paving Engineer's Report

Lt. Col. T. H. Chapman, O.B.E., V.D., consulting engineer of Rubber Roadways, Ltd., recently recounted in an address before the Institution of the Rubber Industry the progress made thus far with and the lessons learned about rubber paving. No claim, he said, can be made that rubber is or can be applicable to every sort of road or condition of traffic, and its price alone will limit its use as a road surfacing material for some time to come to the more important city streets and to special routes and areas where its peculiar advantages can best be realized and be well worth paying for. Nor is it claimed that rubber is superior to granite, asphalt, or wood blocks for all purposes; and while each of those materials has distinctive merits, rubber has properties that the other materials lack as well as many for which they are conspicuous.

The introduction and development of rubber pavements may, said the engineer, have to meet many difficulties like those encountered by wood blocks and asphalt when they were new paving materials 50 and 60 years ago. For a long while they were looked at askance, they were at first dear and often disappointing, and much tedious experimenting had to be done before lower prices could be obtained, ultra-conservative opposition overcome, and standardized specifications evolved. Already, it is contended, rubber is passing very creditably through the first and most critical of the stages of development.

Withstands Time's Ravages

One of the earliest rubber pavements laid, that at the St. Pancras station of the Midland Railway in London, put down in 1870 to lessen traffic noise, still holds up well, having since undergone comparatively little overhauling; in fact, some of the original 2-inch slabs are still in place despite almost 60 years' hard pounding and inclement weather.

When the rubber industry began its great expansion in 1910, general interest was aroused in rubber paving, and a curious variety of rubber-capped blocks and other rubber street-surfacing material soon appeared. Tests of rubber paving were not begun systematically until 1913. These were continued in Southwark for several years with the cooperation of many inventors, rubber growers, and manufacturers, as well as Rubber Roadways, Ltd. Most of the sam-

[1] "Cutting Rubber Paving Costs." INDIA RUBBER WORLD, Dec., 1928, p. 64.

ples submitted lacked proper rubber attachment to the blocks and in the battering of traffic the caps worked loose, or, where they did not become detached, they allowed the rubber to wave and creep along the road surfaces.

Better Blocks Stand Tests

A process of elimination led to the selection of five promising types of rubber paving blocks, and, although rigid tests thus far with them have been very encouraging, they are still being closely watched under most trying conditions for possible shortcomings in busy sections of London, Edinburgh, and Glasgow. These are the Leyland, Gaisman, Cowper, Cresson, and North British blocks; and road engineers are quite agreed that the blocks have quite passed the experimental stage.

The Leyland blocks are 8 by 4 by 3 inches deep, having 2½ inches of hard rubber to which a ½-inch cap of soft rubber is attached. The sides are vertical. The road foundation is concrete with T-irons embedded in it every 12 to 15 feet from curb to curb to prevent block movement. The blocks are coated, except their upper side, with hot bitumen and laid on the concrete. Five years' hard wear seems to have had little or no effect on them.

Self-Compressing Caps

North British blocks are 9 by 4½ inches, the rubber cap being made of semi-hard compound 1 inch thick set in a concrete base and to which is vulcanized a tread of a softer compound 1 inch thick. A chaplet of steel with extending lugs is embedded in the tread so that the lugs serve for anchorage and connection to the concrete base. The latter is slightly smaller than the rubber top to allow space for grouting and for close joining of the treads, which are purposely made slightly convex to obtain close union by compression. Six years of heavy traffic have made no noticeable impression on the paving. A new North British type being developed has the rubber vulcanized to a hard brick and will soon be given practical tests.

Gaisman blocks measure 10⅜ by 8⅝ by 4½ inches, and have a vitrified brick base with a ⅝-inch rubber cap vulcanized into recesses on the upper side. A concrete road foundation is used with a ¾-inch overlay of sand, and the bricks are coated on bottoms and sides with hot "Rubgrip" and jointed with the same cement. Three years of heavy traffic have worn down ¼-inch and more wooden blocks laid alongside at the same time, but meanwhile the rubber blocks have neither shifted nor sustained any appreciable loss in wearing surface. Counting also in their favor are easy removal and replacement for under-road servicing. A new and cheaper Gaisman block, which is said to be also serviceable, has two strips of rubber vulcanized lengthwise on the block.

Interlocking "Carpet" Type

Cowper blocks consist of a 3-piece built-up rubber slab tongued and recessed on four sides. The base is of concrete to which is vulcanized a hard rubber section and to this is affixed in curing, a soft rubber tread. They are laid like granite blocks and their interlocking, it is said, insures rigid position. In a new type the unit consists of two sections 9 by 4½ inches each, yet integrally one, and so designed that one section extends 4½ inches beyond the other, as in ordinary bricklaying. The block is 2½ inches thick and is composed of three compounds of rubber, the underside soft, the center hard, and the top soft and somewhat roughened. The blocks are laid on concrete and being tapped into place, close up well. Thus forming a sort of road carpet, they have been tried out for nearly a year and a half and still show little sign of wear or creeping.

Cresson blocks, originally laid in Singapore, have after seven years there shown practically no wear, although an adjoining road has been since repaired three times. Tried thus far under different conditions in England, they also show remarkable resistance to abrasion. They are made with a 3-inch rubber cap vulcanized to a composition base made of stone chippings, sand, etc., bonded with latex. Including the cap they are 3¾ inches thick, 9 inches long, and 3 inches wide. They are laid on concrete, the bottom of each block and one of its sides being first dipped in hot "Invicta" grouting.

Points to be Determined

While Lt. Col. Chapman deems it advisable for the time being to stick to the smaller surface unit that a block gives, he is hopeful that a form of sheeted rubber material for road surfacing may yet be developed that may lessen cost and time of laying. He especially stresses the need of continued experimenting to devise formulas for treads suitable for various road conditions and having particular regard for the potent factor of price. It may be found that for most needs a lower percentage of raw and a higher one of reclaimed rubber and much cheaper fillers will be found quite satisfactory. Much has already been learned concerning compounding tread material, and considerable success has especially been achieved in overcoming one of the initial problems, road surface creep. While means are not yet available for vulcanizing a rubber road material in place, yet if the necessity arises such a device or process may also be provided.

Despite claims to the contrary, experience has shown, it is held, that with wet rubber paving, skidding or slipping is no more common than upon any other kind of road surfacing, and that as a rule rubber paving is better rather than worse than the other types during inclement weather. Ribbing or roughening of the caps on rubber blocks and simple drainage are advised as a precaution for wet weather. Answering the contention of some that tires do not get so good a grip on a rubber pavement as on other material, a study of friction coefficient of road surfaces, the engineer says, shows that the highest (.693) has been found with rubber against rubber and the lowest (.486) with rubber on concrete.

U. S. Rubber Group Insurance Plan

At the end of the third year of its operation, the Group Insurance Plan of the United States Rubber Co., New York, N. Y., shows 27,284 employes carrying a total of $38,926,000 insurance. During the operation of the plan, a total of $390,000 has been paid on 253 death claims, and $59,500 on 28 total disability claims, a total of $449,500.

The plan is operated on a contributory basis, the employes paying a proportion of the premium, and the company underwriting the remainder.

Among salaried employes eligible to insurance, 9,804 or 92.8 per cent are carrying insurance. Among wage employes, 17,480 or 89.1 per cent of the eligibles are insured.

Imported Rubber Gloves to Bear Mark of Origin in Canada

An order-in-council of June 24, 1929, issued by the Canadian Commissioner of Customs, and effective June 1, 1929, requires imported rubber gloves to be marked with an indication of the country of origin, such as "Made in U. S. A." The goods must be marked, stamped, branded, or labeled with the indication of origin in legible English or French words, in a conspicuous place, which shall not be covered by later attachments, and the marking must be as nearly indelible and permanent as the nature of the goods will permit.

French Rubber Sponges[1]

Since the War, the French rubber industry has developed the manufacture of rubber sponges to the extent of supplying the full demand of the nation for these hygienic toilet accessories.

In this article, several typical formulae are given in which solid and liquid sponging ingredients are employed, and three principal vulcanization methods are detailed.

PREVIOUS to the war, the French demand for rubber sponges was supplied chiefly by Russia and Germany. American-made sponges, however, predominated in France from 1914 to 1920. In the latter year their manufacture was established in France and is proceeding successfully after the methods indicated below.

Gassing Ingredients

Sponge-like structure is produced in very soft plastic mixings of rubber by means of the expansive force of gas liberated from freely volatile ingredients and distributed uniformly throughout the rubber mass.

A number of solid and liquid volatile materials are used to produce the desired uniformly fine spongy state. Among such inflation or gassing materials are butyl and amyl acetate and ammonium carbonate. Another important requisite for successfully sponging rubber is to operate with a mixing sufficiently soft to expand easily and rapidly before vulcanization.

Sponge Rubber Compounds

Four published formulæ are here quoted for making rubber sponges for toilet use. Formulæ 1 and 2 are especially characteristic and exemplify different lines of practice in that the first one contains a solid, ammonium carbonate, for yielding the inflating gas, while the second contains a liquid, amyl acetate, for that purpose.

No. 1		No. 2	
Para or smoked sheet	65.0	Rubber	75.0
Sulphur	2.6	Cinnabar (mercury sulphide)	7.0
Carbonate of ammonium	13.0	Ceresin wax	1.0
Carbonate of potash	2.4	Sulphur	7.0
Golden antimony	13.0	Amyl acetate	10.0
	96.0		100.0

Formulæ 3 and 4 are more elaborate and make use of accelerators of vulcanization. In the case of No. 3, solid ammonium carbonate is used and in No. 4, a group of four liquid gassing materials is used including water. The accelerator used in No. 3 is not disclosed.

No. 3

Smoked sheet	37.000
Caucho	28.375
Carbonate ammonium	17.625
Vermillion (mercury sulphide)	4.250
Barytes	6.500
Sulphur	4.250
Paraffin	0.500
Mineral rubber	0.500
Accelerator	1.000
	100.000

[1] From the French by H. and F. de Poix in *"Encyclopédie du Caoutchouc"* published by La Revue Générale du Caoutchouc, Paris, 1929.

No. 4

Para	50.0
Antimony sulphide	10.0
Sulphur	3.2
Zinc oxide	14.0
Kaolin (clay)	16.0
Barley flour	4.0
Olive oil	1.4
Ricinus (sunflower seed oil)	1.4
Amyl acetate	2.0
Amyl alcohol	1.0
Aniline	1.0
Water	20.0
Denatured alcohol	76.0
	200.0

In No. 4, barley flour and olive and sunflower seed oils are used to facilitate plastication of the mix and make the sponge softer than that produced from the other formulæ. Any of the gassing materials specified in the formulæ should be used in moderation. Any excess is not only a waste of material but will damage the finished goods and shorten their life.

Mixing Operation

The principal feature of mixing the sponge stocks consists in the introduction of sponging ingredients in a mixture sufficiently plastic. This plasticity is obtained by recourse to either of two different methods—first, prolonged mixture, or second, dissolving by using benzine. The first method is apparently easier but has the inconvenience of producing batches which always differ. The second method is favored in factories where the solution is used quickly and the sponge is made from wet stock. In all cases, the introduction of the inflating ingredients comes last in mixing, in order to prevent loss of gas by premature evaporation.

Vulcanizing Methods

Rubber sponges are vulcanized by various means of which the water cure is one. This method is conducted in a jacketed container or boiler. Before starting the vulcanization, the jacketed space is heated for one-quarter of an hour by steam at 56 pounds.

Water is let into the inner boiler until it overflows through a pet cock located five inches from the bottom. Subsequently steam is let into the interior boiler and the pressures raised in two minutes to 65.8 pounds. The pressure in the inner boiler must be 53.2 pounds and maintained exactly. A variation of one and a half pounds pressure per square inch has much influence on the product.

The vulcanization is continued for thirty-seven minutes. At the end of this time, the water in the inside heater is let out quickly. The pressure need not go below 52 pounds.

Eighty-three minutes after the water has been let out, the pressure in the inside boiler is raised to 77 pounds for about one-half minute and then reduced to atmospheric pressure in two minutes.

Chloride of Sulphur Cure

Sponge rubber dough in semi-solution with oily and liquid softeners is sponged and subsequently cured by a patent method outlined as follows:

The process consists of placing in an earthen container a very thick solution of compounded rubber in the carbon bisulphide. The receptacle, the volume of which may be 100 litres, is one-third filled with the rubber solution and connected with a condenser and an air pump. The boiling point of carbon bisulphide in vacuum is excessively low. As soon as the exhaust functions without heat, the distillation of the carbon bisulphide commences, determining the expansion or sponging of the rubber solution.

When sponging is finished, the air is let into the apparatus through a cock located on the cover, and the spongy block of rubber removed. It is next vulcanized by brief immersion in chloride of sulphur diluted with carbon bisulphide; after this it is rinsed successively and thoroughly in ammonia water and pure water to remove the acid present, and then dried.

Whatever process is used for vulcanization of the sponge, the operation is extremely delicate, and should always be preceded by an accurate analysis of the ingredients used, especially of the sulphur yellow if used, for it may cause under-vulcanization or over-vulcanization, the results of which will be apparent after a couple of months and sometimes not until a year after the cure.

Press Cure

Sponges are press cured in molds much the same as other molded goods are cured. Especial care and experience are necessary to successfully proportion the volume of the raw stock to the capacity of the mold. Proper space must be allowed in the mold for expansion of the material by sponging yet not too much allowance, because the sponged stock should cure under pressure against the walls of the mold. Complete sponging should occur before vulcanization; therefore it is necessary for the mold to be heated sufficiently to cause the liberal release of the gas as soon as the rubber is enclosed in the mold, because sponging cannot take place after vulcanization is well advanced.

The time and temperature of curing must be ascertained by experiment for any given stock; also the period of cooling down after vulcanization to control excess expansion of the product.

Trimming

The surface skin of the cured sponge requires to be removed. It has been done by hand trimming with scissors, but this method is slow, expensive, and demands superior skill for its satisfactory accomplishment. Another method is to remove the skin by special card clothing as a hand cutting means. Still another method is to freeze the sponge previous to grinding away the skin.

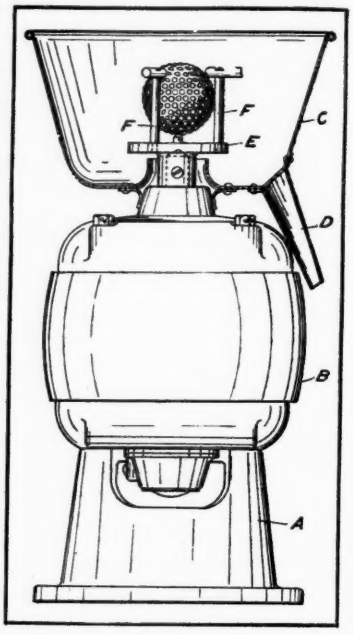
In the case of sponge in loaves, the outer surfaces are slabbed off and the sponge block is cut into desired sizes either by band-saw, and the final trimming done by scissors or grinding according to available facilities.

The consumption in France of rubber sponges is estimated at 4,000,000 annually. They are increasing in favor, and the public is learning by experience their pronounced superiority over natural sponges. In the care of the face and body a rubber sponge is desirable for it can be cleaned thoroughly and may be boiled without injury.

Painting Golf Balls

THE problem of painting gold balls with a thin and evenly distributed coating is handled after a patented machine method[1] as follows:

The machine used is shown partly in section in the illustration. This mechanism coats the balls more rapidly and evenly than previously designed machines. It permits the balls to rotate during the operation and thus insures even distribution of the paint over the entire surface of the ball.



Golf Ball Painter

The device comprises a pedestal *A* on top of which is mounted a motor *B*. A pan *C* surrounds the cage within which the ball is rotated. The basin is provided with a spout *D* for recovery of the excess paint thrown from the ball.

The upper end of the motor shaft supports a disk *E* around which is located a series of equally spaced posts *F*, which retain a golf ball to be painted. The upper ends of the posts are provided with pivoted arms which are free to rotate upon their own axes and confine the ball within its cage but not too close to prevent its revolving within the cage. The ball rests upon a small pin in the bottom of the cage when the rotor is stationary. Paint may be supplied by hand from above and as the ball is rotated, it is instantly and evenly painted.

[1]U. S. Patent No. 1,714,994, May 28, 1929.

Rubber Manufactures in Japan

The following table shows that the value of rubber tires and inner tubes of all kinds produced in Japan is about equal to the value of rubber boots and shoes produced, while miscellaneous rubber products are more important than either tires or footwear in the Japanese industry. Statistics of the number of automobile tires produced are not published; for 1926 and 1927, the number of casings produced annually in Japan is estimated by the Rubber Division as 265,000 and 285,000 respectively. While there are some large factories, the Japanese industry is largely a small factory industry, 530 establishments with a total of 18,483 factory workers being reported as of the end of 1927.

	Boots and Shoes		Rubber Tires of All Kinds	Other Rubber Manufactures	
	Pairs	Yen[1]	Yen	Yen	Total Yen
1923.....	17,593,527	12,308,966	17,299,963	17,473,594	47,082,523
1924.....	14,655,724	12,707,767	14,979,109	24,259,446	51,946,322
1925.....	11,742,122	14,072,707	13,274,972	28,282,803	55,630,482
1926.....	15,080,003	15,979,439	16,715,994	25,904,815	58,600,248
1927.....	17,171,984	18,153,001	19,874,465	28,028,801	66,056,267

(Department of Commerce and Industry, Japan.)

[1]The yen is a Japanese coin, of gold it is worth 49½ cents, United States currency, and of silver, 49 cents.

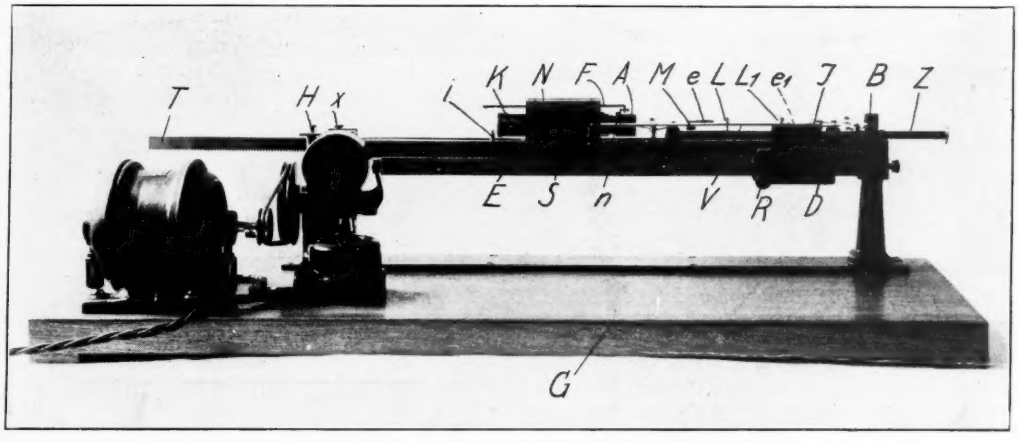
Rubber Thread Tester

An Unusual Device for Testing the Tensile Strength and Elongation of Rubber

THE motor-operated testing machine here pictured and described is of German design and intended for measuring the tensile and elongation of rubber thread. The machine is horizontal and can be manipulated by a single operative. Close readings of the measurements are made by means of a "Nonius" instead of a vernier. Altogether, this test instrument is interesting and practical although very much unlike the well-known vertical type of American rubber testing machine.

Description

The machine is operated on test pieces 55 mm. (2.15 inches) long. The essential features of the apparatus, indicated in the illustration comprise the following parts: Base plate *G*; dynamo meter *K* with scale *F* and Nonius *N*; two clamping tongs *J* and *M*; movable carriage *S* with the driving rack *T*. The feed or control device consists of engaging bolt *H* and disengaging plate *X*. The elongation measuring device *D* and the electrical drive complete the apparatus.



German Tensile and Elongation Tester

The dynamo meter *K* consists of a sleeve with a helical spring. The bushing is inserted in a perforation of the carriage *S* and fastened there. At the right end of the helical spring a cleat *A* is arranged which carries the clamping tong *M*, consisting of several joints. The carriage *S* is firmly connected with the rack *T* in the teeth of which a gear of the drive engages by pressing on the bolt *H*. The disengagement of the rack *T* takes place by pushing plate *X* to the left either by hand or automatically through the pin *i*. The clamping tong *J*, consisting of several joints, is supported in the stationary cleat *B*. To one jaw each of clamping tongs are fastened the stop pins *e* and e_1 to actuate the automatic opening of the tongs *J* and *M*.

The sample 55 mm. long for test having been inserted in the tongs, the carriage *S* is moved by hand toward the left until the tongs clamp fast the test piece while the pins *e* and e_1 just touch the opposite tong jaws. The test piece is to extend from the tongs 5 mm. each to the right and to the left. The pins *e* and e_1 are each provided with two annular marks. By these annular marks is shown the test length for the sample necessary for the ascertainment of its elongation. It is 20 mm. and is transferred to the test piece by two ink marks. If, thereupon, the scale *F* is shifted toward the left up to the stop *n*, so that the zero point agrees with the zero point of the Nonius *N*, then with the exception of the elongation measuring device *D*, the apparatus is adjusted for the initial position for an elongation test.

The ascertainment of the elongation takes place by means of the measuring device *D*. On the rack *E*, carriage *R* is arranged displaceably on which are fastened the Index *L*, and the elongation ruler *V*. Carriage *R* also carries the rod *Z* with the index *L* which has a free passage through the carriage *R*. The rod *Z* is moved by the operative's right hand toward the right or left, and the index *L* fastened on the rod *Z* participates in this motion. If the index *L* is adjusted to the zero point of the scale *V*, then the distance between the two indexes *L* and L_1 is 20 mm. Without changing the position of the indexes *L* and L_1 displace the carriage *R* on the rack *E* in such a manner that the indexes *L* and L_1 are exactly above the ink marks of the test body.

The tensile and elongation test is now made in the following manner. After connecting the driving motor and engaging the rack *T* by means of the engaging bolt *H*, the test body is clamped in or loaded. The loading is transferred to the scale *F*.

In connection with tensioning the test piece, the distance apart of the two ink marks is constantly changed. Therefore it is necessary to actuate with the right hand and at the same time with the left hand, the elongation measuring device *D* in such a manner that the index *L* is continuously opposite the left ink mark and that the index L_1 is continuously opposite the right ink mark. The operation requires some practice, however, but skill can be quickly acquired by making a few blind tests.

Upon the breakage of the test body the elongation measuring device *D* is immediately stopped. From the scale the tensile strength value in kilos is read and from the position of the index *L* one reads the elongation from scale *V* in millimeters. Multiplying the millimeters read by 5 gives the elongation value in per cent.

EDITORIALS

Mechanized Industry Yields Most

THE most highly mechanized of the larger industries, according to Babson, yield the highest value of products per worker. Automobile making comes first with $4,108; and nine are listed (rubber not included), the last being cotton textiles with $1,389. The high earnings of these businesses, which use machinery extensively, are contrasted with the low earnings of agriculture, in which man power is still the dominant factor. In brief he finds that those industries that are making the most use of labor-saving machinery are scoring the best records.

Some industries lend themselves more quickly than others to mechanization, which may account for rubber manufacturing not being yet ranked among those with very high output per worker. But the rubber industry's lag is more apparent than real. More than ever is the industry appreciating the value of mechanical aids. It has been estimated that in some important lines one man today will turn out as much as three produced only a few years ago; and, while other agencies have helped much, such advance may be largely credited to increasing mechanization and standardization. That such efficiency will be quickened through the more general adoption of labor-saving devices is self-evident.

* * *

Price and Profit Prospects

BUSINESS analysts are quite agreed that trade is uncommonly healthy and they give a cheerful forecast, the consensus of opinion being that the unprecedented activity of the first six months of 1929 in the tire and other divisions of the rubber industry, during which time the profits of many leading companies had been reaching new levels, should extend over a long period. Even though original equipment of tires may lessen later with seasonable let-up in car production, it is estimated that owing to the heavy output of cars in 1928 and 1929 the more probable replacement demand will continue to break all records. Some minor recessions may occur, but it is deemed unlikely that prices of tires or of rubber goods generally will be appreciably lowered in the near future. In fact, many conditions favor a general stiffening.

But what of the cost of leading raw materials? With regard to cotton, a steady market seems well assured with prospects of reasonable prices. While the April 1 figure was 20.75, that of July 1 was 18.20, indications being that this year's crop with the 1928 hold-over will more than suffice to supply demands. Fabric manufacturers have, it is said, already contracted for the bulk of their requirements.

As for crude rubber prices, there seems to be little real anxiety about any pronounced enhancement. While bulls try to vision a let-down in tapping until prices prove more tempting to producers and find comfort in the statistics of largely increasing consumption, the bears contend that production has been responding amply to rising requirements and that the "invisible" surplus of rubber on estates, ready to be released if prices attempt to rise, is very much larger than is generally supposed. As for world stocks, there is such a diversity of estimates and such conflicting data about them that both bulls and bears find the figures confusing in guessing market trends.

There is no doubt that more rubber acreage is steadily coming into bearing, that the average number of pounds per acre is tending to rise from about 335 to a much better level, that present prices afford efficient producers a fair profit, and if imports have recently been large, the chances are that buyers have been providing not for immediate needs only but for needs of many months hence. Inasmuch as they have been stocking up at a reasonably low price range, it is safe to predict that there will be for 1929, and perhaps 1930, no rubber inventory write-offs such as distressed so many in 1928.

* * *

More Light on Vulcanization

SO many interesting explanations have been made as to the nature of the vulcanization reaction that just another one from a new angle cannot add much to the rubber tyro's perplexity. The newest, although offered as but a hypothesis, is the outcome of a study of the power factor and dielectric constant in viscous insulating materials, including vulcanized rubber. It was observed that in applying the theory of molecular orientation, even definite electrical features of rubber-sulphur compounds could be predicted qualitatively. Especially it was noted that "maxima in dielectric constant and power factor occur at lower sulphur contents the higher the applied current frequency." This and other data collected prompt the belief by D. W. Kitchin that were a thorough study made of the electrical properties of vulcanized rubber a much clearer idea might be obtained as to what actually occurs in the union of rubber and sulphur.

* * *

ECONOMISTS SAY THAT A DOLLAR DOES NOT BUY HALF so much as it did 15 years ago. That may be true of some things, but 15 years ago a tire-mile cost car users twelve times as much as it does today.

What the Rubber Chemists Are Doing

Dispersion of Pigments in Rubber—II[1]

ERNST A. GRENQUIST

THE following extract summarizes the author's observation under the microscope of the process of vulcanization with sulphur.

The dispersion of pigments in rubber during vulcanization as reported in a previous paper[2] has been further studied, but in this case the whole process has been watched continuously under the microscope. Various compounds were cured in a steam-heated micropress developed by Hauser and Hunemorder[3]. The investigations are not yet concluded, but a short summary will be given of the most important results obtained.

When unmilled smoked sheet was heated for 16 minutes at 140° C., distinct brownish masses began to appear in the focus of the microscope, indicating a gradual formation of resin aggregates (Figure 1). They showed no signs of melting or decomposition when the rubber was heated to 150° C. or above. The resin glycerides evidently are adsorbed originally in a highly dispersed state on the surface of the latex globules and probably to a great extent remain in such a state when the coagulation process is concluded. The formation of resin aggregates seems to be due to a destruction of the rubber structure by heat in the same manner as during mastication. The solubility and chemical reactivity of these aggregated resins are naturally decreased to a great extent when they change from the highly dispersed to the aggregated state. The crude rubber exhibited a pronounced plastic flow during the heating, which ceases very slowly.

The mobility of the rubber comes to a very sudden stop during the first minutes of heating if sulphur or sulphur and accelerator are added to the system, as has been also brought out by Hauser[4]. Aggregation of resin crystals takes place when rubber is heated with sulphur, and in addition there seems to be a crystallization of various mineral matter. In this case, however, the resin aggregates show dissolution and disintegration to a certain extent and it seems that a reaction takes place between the rubber resins and the sulphur[5].

During milling some of the sulphur particles are dissolved in the hot rubber on the mills and crystallize out in form of small rhombic crystals when the mass cools (Figure 2). These rhombic crystals disappear (Figure 3) during vulcanization at a low temperature, around 60° C., without any noticeable melting, as was established by using an electrically heated pressure chamber, where the temperature could be raised gradually from room to vulcanization temperature. They seem to sublime directly into the rubber. This fact is of importance as solution of sulphur in rubber evidently is a prerequisite of vulcanization. The large undissolved particles slowly assume a more and more spherical shape and finally melt at about 120° C., forming large globules. These slowly decrease in size, the speed depending on the accelerator and other compounding ingredients present in the system (Figure 4). From a dispersion point of view the presence of the small rhombic crystals is advisable. The large sulphur particles when melting usually produce an aggregation of adherent carbon-black particles. After the heating is discontinued, a crystallization of free sulphur takes place at different lengths of time, depending on the compounding ingredients used. Various types of sulphur crystals are encountered, which have been studied and described in detail by Hauser[4] and others.

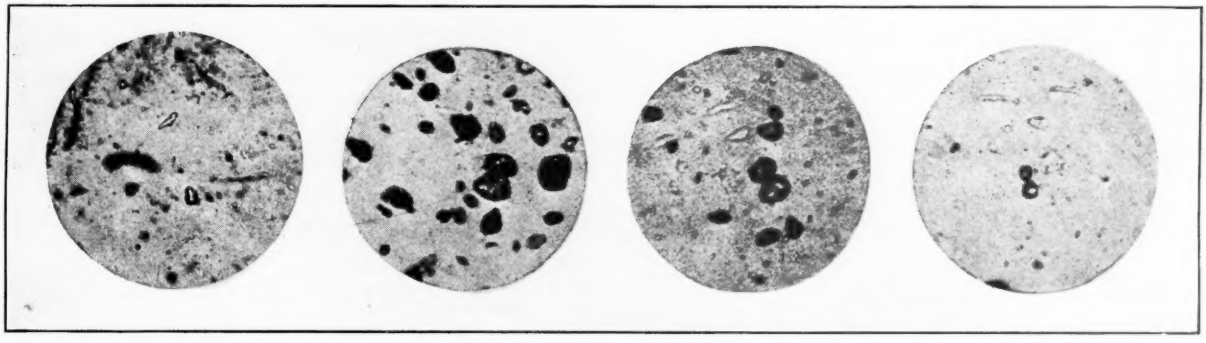


Fig. 1. Crude rubber at 140° C 600 × . The distinct white masses are resin aggregates. The black areas represent dust and impurities present in the rubber.

Fig. 2. Recrystallized rhombic sulphur crystals and large undissolved sulphur particles at 140° C. at the beginning of vulcanization. The rubber exhibits plastic flow in the direction to the left.

Fig. 3. Two minutes at 140° C. The rhombic sulphur crystals have disappeared and the plastic flow of the rubber is beginning to cease.

Fig. 4. Ten minutes at 140° C. The last traces of sulphur are disappearing.

The observations in regard to the dispersion of zinc oxide and carbon black during vulcanization can be summarized as follows: When zinc oxide was added to a rubber-sulphur mixture and the system heated, a dissolution of pigment particles was observed. This evidently was due to the formation of soluble zinc soaps[6, 7]. The flocculation of pigments in a mixture containing 5 per cent of zinc oxide was most prominent during the first minutes of vulcanization (140° C.), but was followed by deflocculation. When rubber was heated with carbon black alone, there was a considerable flocculation of the pigment even though no sulphur was present due to an increased mobility of the rubber. The resin crystals had a great adsorptive tendency towards the carbon-black particles and frequently acted as nuclei for aggregates. The formation of crystals from the free sulphur was considerably inhibited by the carbon-black particles, this probably being partly due to their adsorptive capacity toward sulphur and partly because they fill up the rubber matrix forming a close network, which prevents the formation of large sulphur crystals in the rubber.

When stearic acid was added to the above rubber compounds,

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[1]Presented before the Division of Rubber Chemistry at the 76th Meeting of the American Chemical Society, Swampscott, Mass., September 10 to 14, 1928. The author is connected with The Fisk Rubber Co., Chicopee Falls, Mass.

[2]INDIA RUBBER WORLD, Nov., 1928, p. 74.

[3]Hauser and Hunemorder, INDIA RUBBER WORLD, 79, 59 (1928).

[4]Hauser, "Colloid Symposium Monograph," Vol. VI, p. 207 (1928).

[5]Weber, "Orig. Com. 8th Intern. Cong. Appl. Chem.," 9, 95.

[6]Martin and Davey, *J. Soc. Chem. Ind.*, 44, 317T (1925).

[7]Bedford and Winkelmann, *Ind. Eng. Chem.*, 16, 32 (1924).

there seemed to be a greater formation of resin aggregates during mastication than in previous cases, perhaps because the rubber structure was destroyed to a greater extent. The plastic flow of the rubber increased during vulcanization.

The effect of various accelerators as noted under the microscope during vulcanization was characterized by the speed with which the sulphur disappeared from the system. This varied from 3 to 15 minutes, depending on the accelerator and type of compound, when the temperature was raised immediately to 140° C. at the beginning of vulcanization. The plastic flow of the rubber and the length of time until the free sulphur began to crystallize out also varied with different accelerators.

When extracted rubber was heated under the microscope, the plastic flow of the rubber increased tremendously, because the original rubber structure had been destroyed. It was very difficult to disperse the pigments on the mill. The zinc oxide showed a greater tendency to form secondary particles during vulcanization than carbon black. The free sulphur crystallized out almost immediately after the system had cooled down.

China Clay as a Reenforcing Agent in Rubber Compounding[1]

T. J. Drakeley and W. F. O. Pollett

Summary and Conclusions

THE following are the principal facts which have been demonstrated:

1. None of the clays considered in this investigation retarded vulcanization, but some had a distinct accelerating action; whereas the carbon blacks retarded vulcanization.

2. Those clays which accelerated vulcanization apparently owed this effect to the alkali they contained since the rate of cure was increased to the same extent by an equivalent amount of sodium carbonate.

3. The addition of a small proportion of stearic acid did not appreciably affect the accelerating action of china clay, but it practically eliminated the retarding action of the carbon black.

4. The addition of a given clay or gas black to the base mix affected the rate of cure to an extent roughly proportional to the quantity of pigment added.

5. Tensile measurements made during the summer and winter respectively were not strictly comparable since the temperature had a definite influence on the results.

6. The elongation at a given stress was greater and the tensile strength was lower during the summer than in the winter.

7. Up to the maximum proportions used successive additions of any one of the china clays to the basic mixing caused the stress-strain curves to be displaced towards the stress axis in the manner characteristic of reenforcing agents.

8. The china clays examined considerably increased the tensile strength of the basic mix when added in quantities less than about 18 per cent by volume of the rubber content.

9. In the compounds examined, the more highly refined china clays increased the tensile strength to a greater extent than an equal volume of high grade gas black, provided the volume loading did not exceed about 20 per cent.

10. The china clays increased the resilient energy of the base mix considerably.

11. In most cases the maximum resilient energy was developed when china clay was added to the extent of about 12 per cent by volume of the rubber content.

12. Under the conditions which existed in this investigation, the highest volume loading at which any of the clays produced an increase in resilient energy was about 25 per cent.

13. An ordinary good quality china clay, which had not been specially refined, reenforced considerably at low volume loadings, but failed to maintain its reenforcing action up to such high loadings as the better grades of clay.

14. The china clays produced a maximum increase in resilient energy higher than that given by the gas blacks, but failed to reenforce at such high volume loadings as the better quality gas black.

15. Of the clays examined, stockalite had the greatest reenforcing effect.

16. Under the conditions adopted, stearic acid had an adverse effect on the tensile strength and resilient energy of compounds containing a refined china clay; whereas those properties were improved by stearic acid in the case of carbon black compounds.

17. The addition of a small proportion of stearic acid did not appreciably affect the volume loading at which either the clay or gas black produced maximum resilient energy.

18. Stockalite gave a higher value for the Δ A function than either of the carbon blacks in the series of compounds which did not contain stearic acid.

19. The slope of the stress-strain curve for the base mix was at first increased by the addition of the reenforcing ingredients, but in some cases a maximum value for the slope was reached, beyond which it diminished with further pigmentation.

20. It has been shown that the rigidity of a rubber compound is not satisfactorily expressed by the stress required to produce a given elongation, particularly when the effect of gradually increasing pigmentation is being considered.

21. The rigidity was expressed more satisfactorily by the elongation which a given stress produced.

22. The carbon blacks increased the rigidity of the base mix to a greater extent than equal volumes of any of the clays.

23. The stiffening action of the china clay and carbon black was not improved at low volume loadings by the addition of stearic acid, but was improved at higher volume loadings.

24. It has been shown that the stiffening action of a reenforcing agent was largely independent of its influence on the tensile strength.

25. The concavity factor of the basic mix was affected to approximately the same extent by equal volumes of the various grades of china clay.

26. The china clays did not increase the concavity factor of the base mix to such a great extent as the same volume of either of the gas blacks.

27. As pigmentation proceeded, the effect on the concavity factor of further additions of the reenforcing ingredients gradually diminished.

28. The concavity factor of a rubber compound was not influenced appreciably by the addition of a small proportion of stearic acid.

29. The alkali, as distinct from the clay in which it was present, was probably responsible for a slight reenforcing effect.

30. A slight deterioration of a highly refined china clay was shown to have occurred after storing for a year under the unfavorable conditions of a chemical laboratory.

[1] *Inst. Rubber Indus.*, Vol. IV, No. 5, Feb., 1929, pp. 458-460.

SPDX—a New Accelerator

Speed-X (SPDX) accelerator is adapted to temperatures as low as 258° F., 20 pounds' steam pressure, and while primarily intended for curing at this heat, it is effective and economical at higher temperatures. Chemically, it is the metallic salt of a new and complex organic compound. It is a finely divided, reddish brown powder having a specific gravity of about 1.60, and is perfectly stable under all normal factory storage conditions.

This accelerator mills into rubber easily, and it may be incorporated into master batches in large amounts without undue softening of the rubber. Under the usual proper factory conditions it has no toxic effect upon the workers who handle it.

SPDX is more than ordinarily efficient in all tire stocks. It is equally valuable to the mechanical compounder, but is not recommended for very light or delicately colored stocks. Its action is not retarded by carbon blacks, clays, rosin, or stearic acid. In fact stearic acid gives somewhat stronger stocks, and when SPDX is used in a pure gum stock, it is necessary to either combine Phenex with it or to add stearic acid. Where, however, SPDX is used in a carbon black compounded stock, such as a typical tread, it is not necessary to use either Phenex or stearic acid, but somewhat higher tensiles at break may be secured by the addition of either Phenex or stearic acid.

SPDX stocks possess medium to high modulus, high tensile strengths, flat curing curves, and excellent aging properties and give full benefit of low temperature vulcanization with minimum handling danger.

Accelerator combinations sometimes prove very effective, and it has been found that SPDX, when used with Phenex (a higher temperature accelerator recently developed by the same company), gives remarkable economy and rapidity of cure, while ease of

handling is in no wise sacrificed. For all "pure gum" types a combination of half SPDX and half Phenex is recommended. This mixture is ideal for carcass stocks, not requiring stearic acid, and yielding stocks with exceptional adhesion, elasticity, and strength.

Rubber Division A. C. S. Chicago Rubber Group

A meeting of the general organization committee of the Rubber Group of the Chicago Section of the American Chemical Society was held in the Chemists' Clubroom of the City Club, Chicago, Ill., on June 28, at 8:45 P. M.

The following members of the society were present: J. Kirschner, Dryden Rubber Co.; U. H. Parker, Featheredge Rubber Co.; F. S. Malm, Western Electric Co.; H. B. Underwood, Ajax Rubber Co.; C. E. Frick, Van Cleef Bros.; G. H. Ellinwood, representing S. Collier, Johns-Manville Corp.; Otto J. Urech, Inland Rubber Co.; E. A. Armit, United States Rubber Co.; R. C. Knapp, Mechanical Rubber Co.; Ben W. Lewis, Wishnick-Tumpeer, Inc.

Dr. Carl Frick, of Van Cleef Bros., was elected chairman; Otto Urech, of Inland Rubber Co., vice chairman, and Ben W. Lewis, of Wishnick-Tumpeer, Inc., secretary for the ensuing year. The chairman appointed a committee to meet with the Board of the Chicago Section to receive their sanction of this group organization and to receive a place on the program. The committee consists of the following: F. S. Malm, chairman; E. A. Armit, J. Kirschner, Ben W. Lewis, C. E. Frick.

The purpose of the group is the presentation and discussion of papers of interest to men in the plant as well as the chemists. The general committee believes that much can be accomplished by such a plan toward closer cooperation between the laboratory and factory. It was agreed also to invite the men in charge of factory production to be guests of the group until a plan can be arranged for them to take an active part in the organization.

Chemists, plant men of rubber factories, and those in charge of the technical departments of rubber consumers, supplies, etc., are eligible to membership. The general committee suggests that all men interested in joining this group send their names and addresses to Ben W. Lewis, secretary, Chicago Rubber Group, 365 E. Illinois St., Chicago, Ill.

Rubber Division Meeting at Atlantic City

The fall meeting of the American Chemical Society will be held at Minneapolis, Minn., the week of September 9. The Rubber Division will meet at Atlantic City, N. J., as guests of the New York Rubber Group on September 26, 27 and 28.

Rubber Bibliography

SYNTHETIC RESIN AND EBONITE DUST MOLDING.—Anon., *Rubber Age*, London, July, 1929, pp. 180-81. Illustrated.

INVESTIGATIONS INTO LYOPHILE COLLOIDS, I.—H. Kroepelin, *Rubber Age*, London, July, 1929, pp. 182-88. Translated from *Kolloid-Z.* April, 1929. Tables, graphs.

THE CONSUMPTION OF ACCELERATOR DURING VULCANIZATION, PART II.—L. V. Wistinghausen, *Rubber Age*, N. Y., June 25, 1929, pp. 319-21. Translated from *Kautschuk*, Vol. 5, Nos. 3-4, pp. 57-61, 75-77, Mar.-Apr., 1929. Tables, graphs.

CHINA CLAYS AS RUBBER-COMPOUNDING INGREDIENTS, PART I.—W. F. O. Pollett and T. J. Drakeley, *India Rubber J.*, June 29, 1929, pp. 973-74. Graphs.

TOXIC SUBSTANCES IN THE RUBBER INDUSTRY, PART I, BENZOL.—P. A. Davis, *Rubber Age*, N. Y., July 10, 1929, pp. 367-68.

SOME PRACTICAL METHODS OF MEASURING GAGE AT THE CALENDERS.—E. O. Dieterich, *Rubber Age*, N. Y., July 10, 1929, pp. 375-77. Illustration, graphs.

REPORT ON RELATIVE VIBRATION ABSORPTIVE PROPERTIES OF CERTAIN TYPES OF RUBBER.—Anon., *R. G. Bulletin*, June, 1929, pp. 443-51. Illustrations, tables.

RUBBER PADS FOR WIRELESS RECEIVING SETS.—Anon., *India Rubber J.*, June 22, 1929, pp. 16-17. Illustration, table.

THE RUBBER INDUSTRY IN THE MIDDLE EAST.—F. G. Galang. *Bull. No. 42, Dept. Agric., Philippine Islands.* P. 121. Manila, Bureau of Printing, 1928.

DE INVLOED VAN DE BEREIDINGSWIJZE VAN DJAMBIRUBBER OP DE KWALITEIT VAN HET PRODUCT.—J. Groenewege and A. Luytjes. *Korte Med. v. h. Alg. Proefsta. v. d. Landbouw, No. 7, Dept. v. Landbouw, Nijverheid.* P. 12. Buitenzorg, Archipel Drukkerij, 1928.

A NOTE ON CONTOUR TERRACING FOR RUBBER.—T. H. Holland. *Trop. Agric., Ceylon*, 1929, 72, 3-10.

COMPARISON OF THE DIFFERENT METHODS OF TAPPING PARA RUBBER.—J. M. Ejercito. *Philippine Agric. Rev.*, 1928, 21, 398-404.

ÉCRÉMAGE DU LATEX D'HÉVÉA.—A. Kopp. *Rev. Bot. Appl. et d'Agric. Trop.*, 1929, 9, 138-142.

YIELDS OF FUNTUMIA RUBBER ON EXPERIMENT STATIONS 1906-28.—G. H. Eady. *Bull. No. 14, Dept. Agric., Gold Coast.* P. 26. London, Waterlow & Sons, Ltd., 1928.

IL GUAYULE.—A. De Benedictus. *Agricoltura Coloniale*, 1929, 23, 16-18.

EFFECT OF MIXTURES OF CRUDE OZOKERITE AND AGERITE ON THE AGING OF RUBBER MIXTURES.—F. Kirchhof, *Caoutchouc & Gutta-percha*, 1929, 26, pp. 14,501-3.

ACCELERATOR CONSUMPTION DURING VULCANIZATION.—L. V. Wistinghausen, *Kautschuk*, 1929, 5, pp. 57-61.

ELECTROKINETIC POTENTIAL OF RUBBER.—B. N. Ghosh and P. Stamberger, *Kautschuk*, 1929, 5, pp. 99-100.

NEW DEVELOPMENTS IN THE RUBBER INDUSTRY. THE PEACHEY PROCESS.—F. Jacobs, *Caoutchouc & gutta-percha*, 26, pp. 14-506-9 (1929).

MAKING RUBBER GOODS OF LATEX BY ELECTRODEPOSITION.—Paul Klein, *Chem. & Technol.*, 2, pp. 278-84 (1929).

FACTORS IN WORK CONTROL OF PLASTICITY BY THE WILLIAMS METHOD.—T. L. Garner, *India Rubber J.*, July 6, 1929, p. 10.

THE RELATION BETWEEN STRESSES AND DEFORMATIONS, WITH SPECIAL REFERENCE TO RUBBER.—Rafaele Ariano, *Nuovo Cimento*, Vol. VI, No. 3. Mar., 1929. Published separately, 33 pages.

THE COEFFICIENTS OF FRICTION BETWEEN RUBBER AND OTHER MATERIALS.—Rubber Tires. Rafaele Ariano, in *Politecnico*, No. 5, 1929, 15 pages.

THE ACTION OF ORGANIC ACCELERATORS OF VULCANIZATION.—Paul Bary, *Rev. gén. Caoutchouc*, June, 1929, pp. 3-8. Tables.

THE PNEU CABOCHONS (Pneumatic Tire with Raised Semi-circular Bosses on the Tread Surface.)—*Rev. gén. Caoutchouc*, June, 1929, pp. 15-16. Illustrated.

RUBBER SOLUTIONS.—*Gummi-Ztg.*, June 14, 1929, pp. 2099-102.

THE CALORIC EFFECTS ACCOMPANYING THE SPONTANEOUS PROCESSES OF DENSIFICATION IN RAW RUBBER.—H. Sachse, *Gummi-Ztg.*, June 28, 1929, pp. 2216-18. Diagrams.

ELECTRIC VULCANIZATION APPARATUS FOR AUTOMOBILE TIRES.—F. Schott, *Gummi-Ztg.*, June 28, 1929, pp. 2221-22.

TABLE OF THE PROPERTIES OF THE ACCELERATORS, 774, 576, CAPTAX, AND VULCANO.—Dr. Rudolf Ditmar and Wilhelm Dietsch, *Caoutchouc & gutta-percha*, June 15, 1929, pp. 14584-85.

ON THE REDUCTION OF RUBBER STRESS-STRAIN DETERMINATIONS.—W. B. Wiegand and H. A. Brendle, *Ind. Eng. Chem. (Analy. Ed.)*, July 15, 1929, pp. 113-17.

A NEW PLASTOMETER.—E. Karrer, *Ind. Eng. Chem. (Analy. Ed.)*, July 15, 1929, pp. 158-60.

IMPORTANCE OF TEMPERATURE AND HUMIDITY CONTROL IN RUBBER TESTING. II. RESISTANCE TO ABRASION.—*Ind. Eng. Chem. (Analy. Ed.)*, July 15, 1929, pp. 174-80.

THE GENERATION OF RUBBER.—R. L. Dupont, *Rev. gén. mat. plastiques*, 4, pp. 621-23, 745-51 (1928); 5, pp. 237, 239 (1929).

ACTIVE FILLERS FOR RUBBER.—Marja Sagajlo, *Przemysl Chem.*, 13, pp. 154-57 (1929).

NEW MICROSCOPIC METHODS IN CONNECTION WITH THE PROBLEMS OF VULCANIZATION.—E. A. Hauser, H. Miedel, and M. Hünemörder, *Colloid Symposium Monograph*, 6, pp. 207-17 (1928).

New Machines and Appliances

Freas Aging Oven

Aging Oven

THE aging oven illustrated is designed to apply the Geer-Evans and similar life tests involving accelerated aging of rubber and like materials. The requirement is that the sample shall be subjected to a uniform constant temperature of 158° F. (70° C.), in circulating air for periods of time ranging from 3 to 20 days.

This oven provides improved circulation of air, insuring a uniform and constant temperature in all parts of the oven and making it most satisfactory for accelerated aging tests. Two perforated adjustable shelves are supplied with this oven so that it can be used for all other laboratory tests such as drying or vulcanization under controlled conditions.

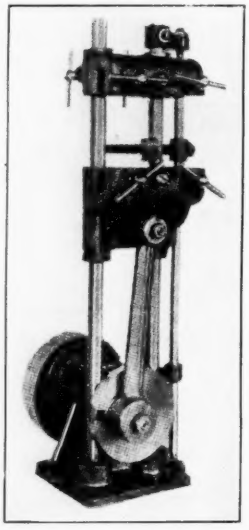
The thermo regulator automatically maintains the temperature constant. This regulator is a sensitive, powerful, differential linear expansion thermostat, made entirely of metal, in which all motion is rectilinear and positive in action. The thermostat may be set without opening the oven.

A ventilating fan motor is set in an insulated air duct in the rear wall of the oven. Air is drawn across the heating plate in the bottom of the oven, which may be either fresh air from the outside or recirculated air. A current of heated air at the rate of four cubic feet per minute is thus forced in at the top of the heating chamber, giving constant circulation past the rubber test specimens. By circulating air in this manner, a uniform temperature is obtained in all parts of the oven.

The rubber specimens are hung by clips from a swinging shelf in the top of the oven. By thus hanging the samples, the greatest number can be placed in the oven. —Freas Thermo-Electric Co., Irvington, N. J.

Rubber Testing Machine

A SIMPLE yet very practical device for testing the fatigue of vulcanized rubber is that pictured in the accompanying illustration. It consists of a cast base fitted with bearings for a short shaft turned by a belt drive at one end. On the other is a disk slotted for adjusting the length of stroke of a connecting rod which imparts upward and downward travel to a sliding yoke or cross-head movable on upright guide posts anchored in the base of the machine.



De Mattia Fatigue Tester

This slidable cross-head serves also as a clamp to hold the lower end of the sample to be tested while its upper end is clamped in a fixed cross-head spanning the top ends of the upright posts. The top jaw is adjustable to any desired position in relation to the lower reciprocating jaw which is adjustable to give travel up to 5¾ inches. The jaws are 1½ inches deep by 7 inches wide.

Test pieces of cured rubber of conventional sizes are tested for elongation, tensile, or endurance by clamping them in the machine and alternately stretching and releasing the tension. This action is kept up continuously at a predetermined speed to the point of failure by breaking.

A most valuable feature of this testing machine consists in the possibility of comparing the degree of vulcanization between a sample cut from a regular product and one cured in a test or sample mold. The information thus secured facilitates perfecting the correct cure for service conditions and to check sample cures.

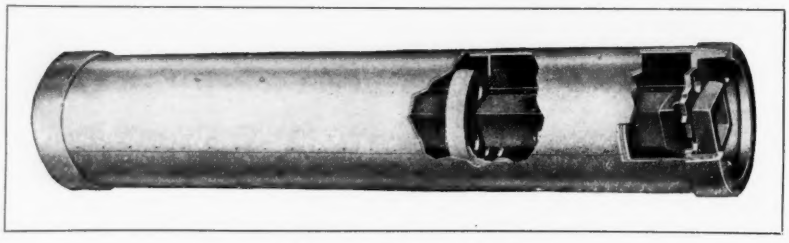
The applications of this fatigue tester are numerous and include all rubber goods from which the features of stretch and resistance against bending and cracking are required in service.—National Rubber Machinery Co., De Mattia Division, Clifton, N. J.

The Super Calender Shell

THE super calender shell, which has recently been perfected, is certainly unique in possessing the following improvements of distinctive merit. The head of the shell is "keyed" to the body and will stand all the strain and torque that can be applied without depending on a single rivet. The rim of the head is tapered and has a depression in its edge. After the head is placed inside the shell-body, a ring member is forced on under tremendous pressure which "keys" the body to the head and curls the end of the body into the recess in the edge of the rim. The ring is secured by a few rivets to prevent it working loose, but tests show that it is impossible to dislodge the head even before the ring was riveted.

The mandrel opening has also been extended to present more wearing surface to the mandrel and to prevent it being inserted far enough into the shell to break down the central tube when a mandrel is used as a lever to move a loaded shell.

Back of the head the body is provided with a 14-gage member which prevents



Gammeter's Super Shell

the head being forced inwardly and reenforces the body against collapse when under the strain of the more rapid cooling of the stock at the edge of the roll.

The body of the shell is made up of two thickness of 14-gage furniture steel, with flush butt joints opposite each other and spot welded, making an extremely strong smooth body. This is reenforced internally with pressed steel spiders that support the central tube through which the mandrel passes. Since the mandrel is the weakest part of rubber mill equipment, it can be seen how this internal construction helps to support the mandrel when in use.

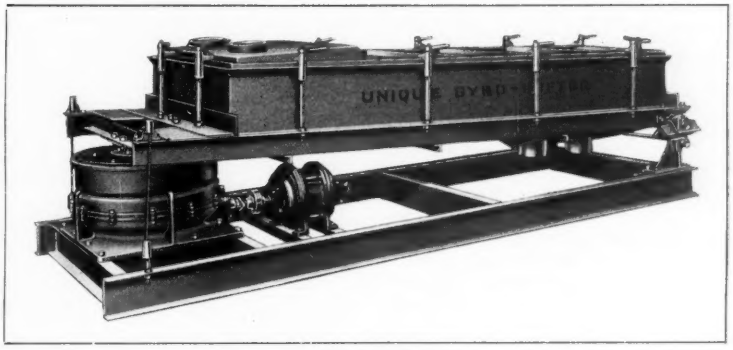
It is conceded that calender shells receive the hardest usage of any rubber mill equipment; so the manufacturers have produced a shell to meet such conditions and will replace the shell free of charge if a head is knocked out or a central tube broken down.—The W. F. Gammeter Co., Cadiz, O.

Unique Gyro-Sifter

MANY of the annoying troubles experienced in rubber goods manufacture can be eliminated by the installation of good sifting equipment as an adjunct to the compounding room. This is especially desirable in the case of all ingredients entering into the make-up of specification goods in order to eliminate splinters, nails, tacks, strings, grit, etc., that are found accidentally included in unspecified powders.

An efficient sifter for this purpose is pictured here. It is characteristically designated as "Unique." It is operated by a gyratory motion and is adapted for any siftable material, producing unfailing uniformity and making separations which conform with results of laboratory tests. Another feature is that each of these sifters is built to order for successful operation on each particular product. They are built in wood and metal.

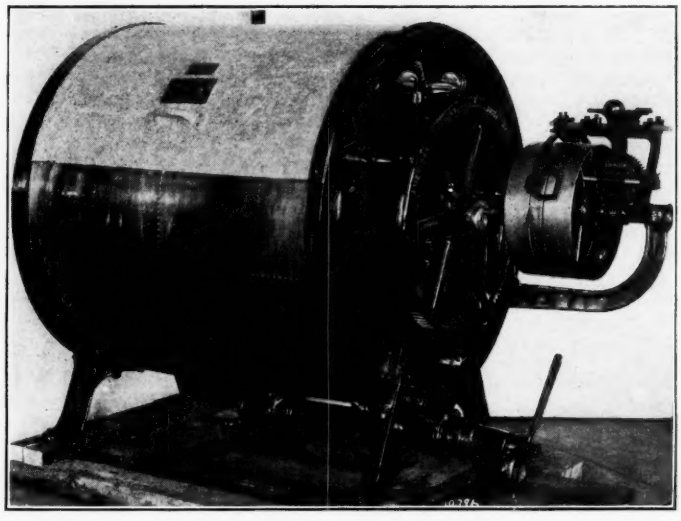
Much of the operating success of this sifter can be credited to the forceful combined gyratory and reciprocal motion imparted to the sieve box by its driving mechanism. This consists of a large counter-balanced wheel mounted on a short trunnion, which is supported on ball-bearings and carried within a rigid pedestal. This entire driving unit is securely mounted on heavy steel channels which form the frame of the machine. The counter-balanced wheel is connected to the sieve box by a driving head which is fastened to an angle bar embracing practically the entire head-end of the sieve box. The connection between the balance wheel and the driving head is made through a self-alining ball-bearing enclosed in a dust and oil-proof casing. The entire driving mechanism is mounted on ball-bearings, is self-contained, runs absolutely noiseless, and requires the minimum amount of power, lubricant, and attention.



The Gyro-Sifter

The throw of the sieve box is accurately counter-balanced by weights in the large driving wheel and can be increased or diminished as the situation requires by simply adding or removing some of the weights.

Unusual capacity and accurately uniform separations result from the improved and efficient cloth-cleaning system employed. This consists of resilient rubber balls placed in each sieve, a number of them being confined in each of the small sections formed by the hardwood crosspieces. The strong gyratory motion of the sieve box causes the balls to travel over the ridged surface of the coarse screen at the bottom of the sieve which, together with steel rod crosspieces, deflects them upward and against the bolting cloth, jarring and vibrating every square inch of cloth surface as long as the machine is in motion.—Robinson Mfg. Co., Muncy, Pa.



American Rotary Washer

Reversible Rotary Washer

FACTORIES producing rubber novelties, molded articles, hot water bottles, syringes, nipples, balloons, etc., which need to be cleansed after vulcanization, formerly employed rotary tumblers, usually improvised from hard-wood barrels, for effecting this work.

A greatly improved and highly efficient machine for this purpose is represented in the accompanying illustration. This is a rotary washing machine designed especially for laundries. The cylinder is constructed entirely of metal and revolves in a wooden shell mounted on a frame standing sufficiently high from the floor to permit clearance for the discharge outlet. The washing cylinder is revolved by a large spur gear and pinion driven by straight and cross-belt pulleys mounted on a bracket attached to the right-hand end of the washer.

In connection with this drive is a mechanism which shifts the driving belts periodically from one pulley to the other thus reversing the direction of rotation of the washing cylinder. Access is had to the interior of the washer for loading and unloading through a slidable door of sheet metal. Hot or cold water can be delivered to the machine by suitable piping. A washer of this sort is also adaptable for washing rubber scrap, straight-hose wrappers, cross-wrapping strips, etc.

Other items of laundry machinery are being applied in the rubber manufacturing industry as, for example, vertically driven hydro-extractors or centrifugal machines, rotary type dyeing machines or what is known as a jig or string-goods dyeing machine. These are used more especially in the case of toy balloons. After the dyeing process in a dyeing machine, the balloons are placed in a hydro-extractor by which the surplus moisture is removed in 10 or 15 minutes. They are then placed in a rotary drying tumbler, through which heated air is passed. In this way the balloons are colored and dried within a very short period of time.

The same machines are also used in the preparation of fabric stripped from old

tire carcasses for conversion into rag carpeting.—The American Laundry Machinery Co., Cincinnati, O.

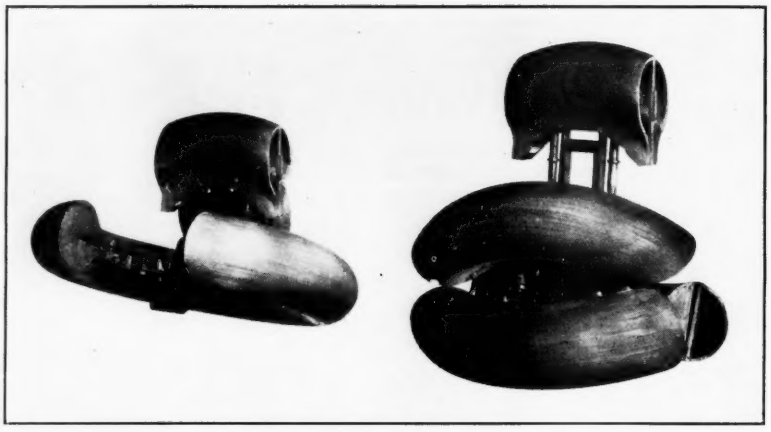
Light-weight Collapsible Tire Building Core

THE India Machine & Rubber Mold Co., Annadale Ave., Akron, O., exclusive manufacturer of the India collapsible chuck and tire building core, has put on the market a light-weight tire building core designed especially for the larger sizes such as the 7, 8, 9, and 10-inch.

There has always been a great amount of unnecessary labor and expense connected with the building of large tires. A great deal of dissatisfaction has been caused by the heavy weight of ordinary cores necessitating the use of chain blocks, while the short life of wooden cores and the great expense of soft metal cores and the maintenance of them make these types uneconomical.

This all-steel core has the necessary strength to withstand the hard usage in connection with building large tires. It is balanced perfectly, which is an important feature in the maintenance of a tire building machine. When used with the India collapsible chuck which is possible in the 7- and 8-inch sizes, it is very easy to manipulate.

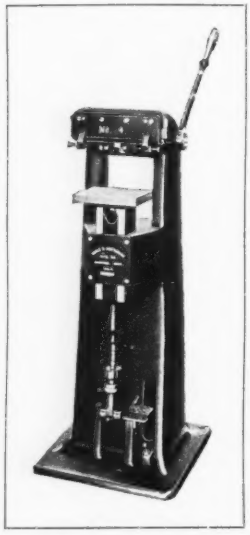
The 9- and 10-inch size constructed as a two-ring type is easily handled because of the extreme light weight. It is said that the 8-inch core complete with the chuck weighs less than 200 pounds, this being more than 75 per cent less than the weight of a cast-iron core and lighter than any other material now in use.



The India All-steel Tire Core

Marking Machine

THE compact foot-power machine represented in the illustration is designed to mark, by means of steel dies, trademarks, names, letters, numbers, etc., on flat or round metal parts of various shapes and sizes. Such a machine would be particularly useful in the pattern room of a rubber footwear plant for stamping sheet metal shoe patterns, metal tags for groups of patterns, etc. Such marking is commonly done, of course, by means of steel letters and numbers impressed by hand hammer blows, a process far too slow in case much marking must be done.



Foot-Power Marker No. 4

The machine pictured has a heavy frame without projecting parts that might interfere with the operator who stands or sits in front of the machine. He is enabled thus to place the work more rapidly in the holding fixture and also to observe conveniently the movement of the marking die. The parts to be marked are held in a suitable fixture fastened to the worktable of the machine. Pressure on the foot-treadle raises the table and brings the work in contact with the marking die, this movement being accomplished through a compound lever arrangement. The die is moved across the piece to be marked by pulling down the handle which may be set in that position most convenient for the operator. The extra-heavy slide is fitted with roller bearings.

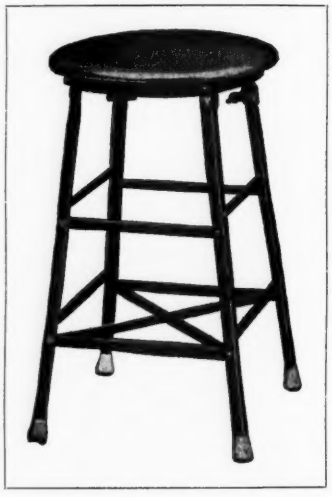
The machine is regularly built to give a mark 4½ inches long, but can be furnished for making marks up to 6 inches in length. Control of the length of the stroke is effected by adjustable stops located on the front of the machine. Movement of the slide is through heat-treated steel gears. The maximum distance between the slide and the table is 8½ inches and 6½ inches under a round die.

A roll die-holder is inserted in a dovetail slot just above the table and an adjusting screw is provided to facilitate changing the position of the die-holder from front to back, which eliminates the necessity of moving the entire work-holder. The die is returned to position for making the next mark by a spring of simple design. The die-holder can be removed from the machine without lowering the table. A flat die-holder can also be supplied. Both round or flat marking dies can also be fitted in part or specially made to take changeable type.—The Noble & Westbrook Mfg. Co., Hartford, Conn.

Office and Factory Seats

SEATS for office and factory workers are designed in many forms, materials, and details of construction, and built to meet certain needs of the various trades and purposes. This variety is especially to be found in steel equipment, which is particularly well adapted for rubber factory service. The single, simple type stool here pictured is a good illustration of a general purpose factory stool without a back. Its frame is constructed of heavy angle steel and all its joints are hand riveted. On chair and stool legs, where special rigidity is necessary, ¾ and ⅞-inch steel is used.

In the special stool illustrated the legs are flared outwardly and the feet tipped with rubber crutch tips so that the seat stands squarely and solidly without slipping. The stool is of hard wood concaved to a comfortable shape and finished in mahogany. The steel frame is enameled in a lustrous dark olive green color.—Angle Steel Stool Co., Plainwell, Mich.



Angle Steel Stool

Rubber Factory Topics

Some Interesting Processes

Rubber Sponge History

Rubber sponge manufacture in the United States was established in 1902 at the Akron plant of The B. F. Goodrich Co. under the late Bertram G. Work, who for many years was superintendent and president of that company. Arthur C. Squires, then one of the development staff under Chief Chemist C. C. Goodrich, was assigned the problem of working out a manufacturing method for producing rubber sponges for toilet and bath use.

Previous attempts to solve this problem failed because experiments were attempted

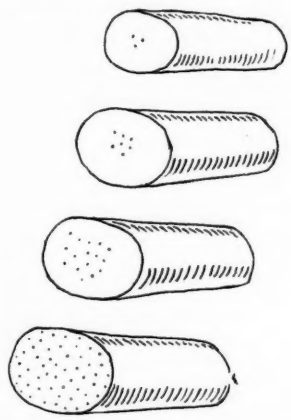


Fig. 1.—Sections of Cured Sponge Rubber Showing Increase of Porosity with Aging

on too small a scale. Mr. Squires began with a 50-pound batch containing dry ammonium carbonate as the sponging ingredient. A sample of this stock cured the day of mixing exhibited no sign of porosity. However, samples were cured daily at the same time and temperature. After each additional day of aging of the raw stock, cured samples showed increase of porosity as indicated in the diagrammatic sample sections shown in Figure 1. Thus it was discovered that 10 days' aging of the rubber mixing was essential to complete porosity of the stock on curing.

In practice, the raw rubber stock is shaped by tubing it through an oval section die, 1¼-inch short diameter by 1¾-inch long diameter for the regular-sized sponge. The receptacle to contain the rubber for vulcanizing is a cotton-lined basket of galvanized woven wire, in form indicated in Figure 2. Vulcanization of the loaf rubber is effected in a "fluid pressure" vulcanizer piped as indicated in Figure 3.

In this vulcanizer the baskets are supported on shelving. The operation of curing is conducted by the following stages. After bolting up the heater, steam at 5 pounds' pressure is admitted for 15 minutes, the pressure is then increased to

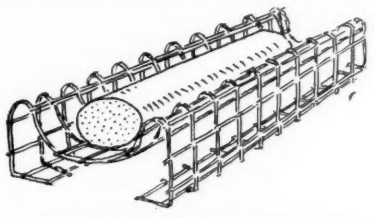


Fig. 2.—Sponge Rubber Curing Basket

10 pounds for 15 minutes. After this preliminary heating, the steam pressure is gradually advanced to 47 pounds during 2½ hours. At the end of that period the steam inlet is closed and the full pressure within the vulcanizer is maintained by admission of compressed air, and the heat cooled down. In this way the gas bubbles in the rubber are prevented from bursting.

When removed from the vulcanizer, the rubber shows in cross section only a mass of gas-filled bubbles. These are relieved of their gas by cutting off both ends of the cured loaf and squeezing it between a pair of compression rollers, as of a

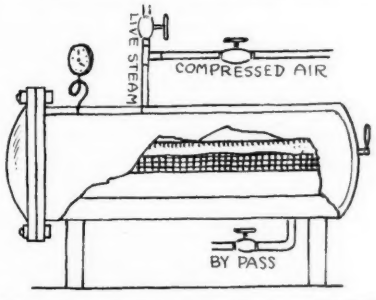


Fig. 3.—Fluid Pressure Vulcanizer

clothes wringer, for example. In this way the gas bubbles are burst, and the rubber assumes a light porous structure, having the soft and absorbent quality of natural sponge.

Surface Finish for Perforated Mats

The surface of punched mats and molded mats and matting of low relief is greatly improved in appearance by the brush application of finely powdered plumbago or black lead. In fact, stove polish answers this purpose perfectly well when applied as a thin water mixture and brushed after drying to bring out a luster.

Static Electricity on Rubber Fabrics

In the May, 1929, issue of the INDIA RUBBER WORLD mention was made of a dressing for the removal of static electricity on power transmission belting. Much trouble from the presence of static electricity is met with by hanging rubberized cloth on bars. Drawing the fabric over these bars generates static electricity sufficient to make it very uncomfortable for the men hanging the material. Reference of this problem to the authors of the belt-dressing investigation elicited the following suggestions as to possible remedies.

If a film of moisture can be maintained on the rubberized cloth by keeping up a high relative humidity in the plant, the static charges may be neutralized as rapidly as they are formed. Another method consists in ionizing the air about the article that produces or holds the static charge. This ionization may be accomplished by means of X-rays.

A neutralizer system is available that is specially adapted to all cases where material in process can be kept under the influence of neutralizer bars located a few inches from it as the fabric passes through rubber spreaders, cloth shearing and carding machines, printing presses, etc.

Dry Lubrication

A method of dry lubrication of machinery bearings to be acceptable must fulfill certain practical conditions. For example, the bearing bushing must be of such hardness that its surface wears rather than that of the shafting, yet withstands the pressure upon it. Also it must retain the lubricant perfectly and apply it constantly over the entire area of the shaft bearing.

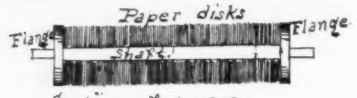
Metalined bushings, bearings, and thrust washers are made of a bearing metal containing only virgin copper, tin, lead, and zinc in proportions best suited for the service to be rendered. The castings from which they are made are poured under strictest supervision. After machine finishing, holes are drilled into the bearing surface to receive the metaline plugs, which are then file finished flush with the bronze surface.

Metaline plugs are composed of metallic oxides, anti-friction metals, graphite, etc. These materials are combined chemically and mechanically, then reduced to a very fine powder which is solidified in hardened steel molds under great pressure into cylindrical plugs. The plugs are about the same length as their diameter, that is $\frac{1}{16}$, ¼, and $\frac{5}{16}$-inch.

In service the lubricating plugs provide the shaft with a smooth surface by filling up every inequality with its dry lubricant substance.

Rubber Coated Fabrics

There are a number of different kinds of coated materials in which the surfacing base is other than rubber. The oilcloth industry, for example, uses considerable linseed-oil material. The artificial leather trade consumes large quantities of pyroxylin for coating material. However, it is the production of calendered rubber textiles that we speak of here.



Section of a paper cylinder showing how the paper disks are held in place.
Figure 1

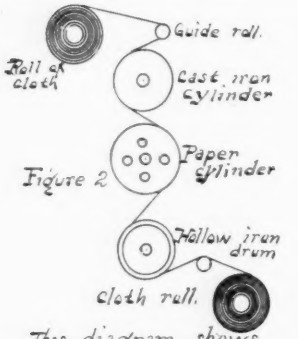


Figure 2
This diagram shows the relative positions of the cylinders of a linen calender.

In one process the fabric is run between rolls built up of paper disks as shown in Figure 1. The disks are held in position by two flanges fastened to the shaft which passes through them. The surface is made smooth and hard by polishing. The position of this roll in the calender is shown in Figure 2, which also shows a cast-iron cylinder and one chambered for heating or cooling. Thus it will be seen that friction, pressure, and a polishing effect can be imparted to the coated material.

The fabric is started off from the upper delivery roll as shown in Figure 2, whence it passes to the guide roll and then down to the cast-iron cylinder where the first work towards glazing the fabric begins. Next the fabric goes to the paper cylinder and then to the hollow metal drum. Both bright and dull finishes are required on surfaced textiles, and the percentage of pressure, heat, and friction is regulated accordingly. Sometimes a soft finish is needed and then again a hard one. In some cases soft woolen blankets are wrapped about one or more of the cylinders to aid in procuring a mellow finish on the rubberized fabric.

When a rubber surfaced fabric with a linen base requires a smooth, hard, flexible rubber finish on the outside and a soft and fleecy surface inside, a linen warp with wool or camel hair filling is often employed. Then the glaze can be put on the rubberized side of the fabric, while the other side can be run over the surface of a teasel or a wire napper and a fluffy pile effect produced. There are modern types of hydraulic mangles for producing this type of goods for the clothing industry; also there are embossing machines. Copper embossed rolls which are engraved for the production of printed figures all one color, that is in relief, are successfully used for this purpose. An embossing roll is shown in Figure 3.

An embossing machine is similar in design to the usual type of apparatus employed for impressing designs on any level object passed beneath its surface. The object may be cloth, paper, or rubberized fabric. The idea is to impress the form of the figures into the surface of the material. No inking or staining substances are used. The roll of the embossing machine is engraved according to the requirements of the pattern to be executed, and a platen or another roller supports the material which is to receive the impression.


One of the embossing rollers.
Figure 3.

Figure 4


Sometimes designs are made on rubber coated surfaces by stencil printing

Stencil printing on rubber-coated fabrics can be done in a different way from that when common stencil plates of thin metal are used or when dado borders for wall paper are stamped. A wooden frame 12 by 20 inches is covered with silk bolting cloth. Then the design is traced on this cloth and the spaces between filled in with shellac, thus making the cloth opaque except for the traced lines, the stencil frame appearing like that shown in Figure 4. The frame is then placed on the rubber coated fabric and the color applied with a brush through the traced lines, for these are sufficiently open to permit the liquid to pass through and produce the pattern on the fabric. In a case like this, a different frame with its silk bolting cloth cover and traced design is needed for each color applied, although some very good effects can be made with one frame and one color.


A design which has been stencil printed.
Figure 5.

Figure 5 shows a design which has been stencil printed on rubber coated fabric.

Cutting Holes in Soft Rubber

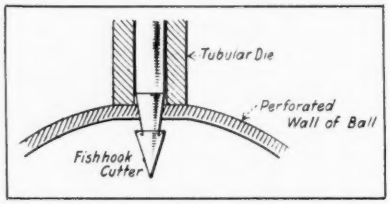
Owing to its toughness and resilient property soft rubber can be bored only with special tools. Thin-walled rubber articles such as hollow balls, bulbs, etc., can easily be bored by the use of a metal tube beveled to a keen edge on the outside at one end. Such a tool is nothing more than a cork borer.

For factory production a cutter of this type is held in the chuck of a speed lathe or drill press and operated at high speed. Water is applied to the cutter to lubricate it. The illustration represents a modification of this style of tool by which the cutting effect is applied at the internal rather than external wall of a hollow article. It cuts a piece from the wall without permitting it to drop into the interior of the article. The cutting edge resembles somewhat a fish hook or crochet hook. The cutter is turned on the end of a solid rod, and is conical and sharply pointed to pierce the thin rubber. Back of the point the circumference of the cone forms the cutting edge, being beveled downwardly on the base of the cone. From the base of the cone the shank of the tool returns to the normal size of the cylindrical stock used to make it.

This tool is revolved by power and cuts outwardly through the rubber from within the ball. It is operated through a tubular die or sleeve which guides the cutting tool. The die portion supports the rubber wall around the hole as it is being cut outwardly from within. As applied to boring bat balls in factory production, this special cutter will bore automatically 85 bat balls a minute.

Disks, rings, and large holes are cut from or through sheet rubber by one or more sharp pointed knives fastened in a cross-bar fitted to the spindle of a drill press. Bar and knives are adjustable to any radius within the maximum sweep of the knife bar.

Holes of small diameter may be bored through slabs of soft rubber by means of an abrasive disk of emery, carborundum, etc., of the size of the desired hole. In this case a drill press would be used and in any method, water is desirable as a lubricant. There is no cutting problem with hard rubber of good quality as it is as readily machined as any metal and by the same tools.



Ball Boring Tool

New Goods and Specialties

Beautiful Non-Slipping Rugs

RAYNBO RUGS that find a use in nearly every room in the house—rubber rugs that resemble grass, rag, and other woven rugs so closely as almost to defy detection—are now being placed on the market by the Joseph Sanitary Rug Co.

Raynbo rugs were first invented for use in porcelain bathtubs. The rugs are made on the same principle as automobile tires, with thousands of tiny vacuum cups on the

Rubber Rugs for Kitchens

underside, which anchor them firmly to any surface—wet or dry—wood, tile, porcelain, metal, or cement. No tacks are necessary. To slip or slide on this rug is practically impossible. It must be lifted to be moved.

Raynbo rugs are modernistic in appearance and harmonize with any scheme of interior decoration. Made in a wide range of colors in the popular sizes, they are used in bathtubs, before kitchen sinks, in solariums, halls, nurseries: wherever the wear is heavy. These rugs are easily

Raynbo in the Bathroom

cleaned with soap and water, and there is practically no wear-out to them.

Raynbo rugs, distributed by the Joseph Sanitary Rug Co., are manufactured under a patented process invented by Mr. Joseph. The Republic Rubber Co., Youngstown, O., is one of the licensed manufacturers of these rugs.—Joseph Sanitary Rug Co., 920-921 Chamber of Commerce Building, Cincinnati, O.

Give the Ears a Chance

WHY provide discomfort for the bather by causing the ears to be crushed into the side of the head by the ordinary diving cap? Bathers want comfort, safety, and satisfaction, dry hair, and water out of their ears. Physicians advise that water rushing into the ears is not only annoying

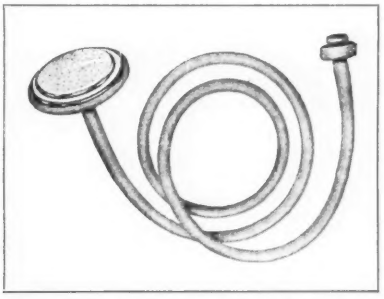
The Radio Diving Cap

but also dangerous. This may be guarded against by the Radio, the latest invention in diving caps, here illustrated. The ears fit perfectly into the circular ear cups, while the band of the cap fits snugly against the skin, thereby preventing any possible chance for water to reach the ears. Radio has shapely lines and the back is modeled to fit the head perfectly.

This diving cap may be worn by men and women. The plain model comes in black, blue, and red moire-effect rubber. The hand-painted model, which is especially attractive, is offered in red, blue, gold, black, and green. The painting, guaranteed to last the entire life of the cap, appears on the sides in a modernistic wavy design in five colors. This imperial finish is the invention also of The Neptune Rubber Mfg. Co., Neptune, N. J.

Improved Bath Spray

SEVERAL improvements make their appearance on the bath spray here illustrated. One is the color; another is its distinctive, deep corrugation; and the third is the new faucet connection. These new pastel bath sprays are available in geranium, white, orchid, pastel blue, and jade green. They have a dome-shape spun-brass head, heavily nickeled, with correctly spaced and cleanly drilled holes. The heads are provided with a rubber buffer ring of the same shade as the tubing, which shows a new and distinctive deep corrugation. The rubber ring prevents bumping and banging and protects the tub or sink from being marred by the head. The faucet connection, which is patented, is an integral part of the tubing and is very simple. In operation, the faucet con-



Bathroom Accessory in Pastel Shades

nection consists of an expanded socket which is slipped over the faucet, and then a molded clincher ring is pulled up to hold the tubing firmly in place.—The Seamless Rubber Co., New Haven, Conn.

Protects Oil-Well Casing

WERE it not for the rubber guards used on the drill pipe which, in oil-well drilling, whirls with its attached string of tools within the casing pipe, the boring outfit would soon damage the casing tube seriously. An improved guard, or rather protector sleeve, is the "6H" shown here-

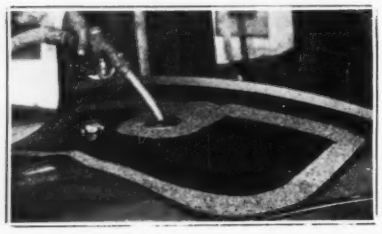
"6H" Protector Sleeve

with. It is of unique design, easily applied on a drill pipe and fastened with a drift pin, is reenforced with a light steel cage molded within tough, oil-resisting rubber. Wear is said to be minimized as there is no tension on the rubber. It is made and sold by Golden State Oil Well Specialties, Inc., 1920 E. Vernon Ave., Los Angeles, Calif.

Rubber-Coated Cloth Mat

THE Hinson Cowl Protector was designed to protect the finish on those cars that have the gasoline tank located beneath the cowl. This mat prevents the gasoline-hose nozzle from scratching or marring the finish of the cowl. It also absorbs any drippings that might mark the car.

This cowl protector is made in two models. The smaller size, Number 2-A, is designed for the car owner, while the larger size, Number 1-A, is for garages and service stations. Number 2-A is made of



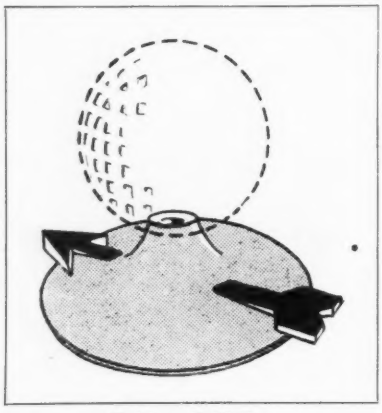
The New Hinson Cowl Protector

heavy, thick grey felt and bound with rubber-coated cloth. Number 1-A is made of thick, heavy grey felt and rubber coated cloth. The edges are neatly bound of the same material. On both sizes there is a metal ring on the opening.

It takes only a second to throw the protector over the cowl, and it fits over the opening without effort.—The Hinson Manufacturing Co., Waterloo, Iowa.

Follow the Arrow for a Perfect Drive

"KEEP your head down and your eye on the ball!" But the temptation to learn the direction of the flight of your golf ball often has ruined completely your drive. "Arrow Tee" will overcome this



Rubber Golf Tee

fault. This all-rubber tee is not just a tee as the name would imply. It supports the ball as any other tee does, but it is really a combination tee and direction guide. Its arrow head and tail are for the same purpose as a gunsight on a rifle. Since it is essential that a golfer endeavoring to direct a ball to a given point have an indication of that direction to guide his drive, the Arrow golf tee was invented to meet this need. The player automatically concentrates his attention on the arrow for his direction, and the desire to raise his head is eliminated.

This tee is so mechanically constructed that while it will not remain stationary if struck by a club-head, it will raise forward but a few feet and then only in the path of the objective direction. It takes no effort to place it on any surface, whether it is frozen ground, deep sand, grass, or the floor indoors. With a light ball, the tee may be used in the house to give the golfer the practice he wants when it is impossible to get to the links. "Arrow Tee" is guaranteed for a season's play.—Arrow Golf Tee Co., 585-7 Elizabeth Ave., Newark, N. J.

New Sunruco Office Specialty

THE ordinary sponge-cup is often unattractive, while its greatest disadvantage is that it is easily breakable An innovation in the field of office equipment is the Daisy Moistener, the latest Sunruco creation. This is an all-rubber, unbreakable sponge-cup. It too has surrendered to the craze for color, and the cup part is in colors—red, green, blue, or brown—a good-looking and serviceable accessory for any type of desk.

Daisy Moistener

A high-grade quality of red rubber sponge with raked or corrugated surface completes the set.—The Sun Rubber Co., Barberton, O.

Top Boot for Roadsters

A SPORTY top boot for Ford and Chevrolet roadsters is marketed by the Hampden Auto Top & Metal Co., Springfield, Mass. The top boot is made of double texture waterproof sport material with the binding of leatherette. It is fastened to the car by buttons.

Twin Insulating Tape

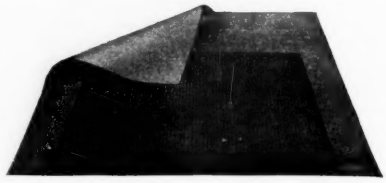
A TAPE of unusual merit for making insulated-wire splices is now available. In construction it consists of 3.60-yard sheeting frictioned on both sides with a high-quality adhesive rubber composition and the addition of a heavy gage of rubber insulation stock on one side. This combination tape is suitably adhesive and retains this quality indefinitely since it is rolled in glazed holland. For electricians' purposes one pound of this tape is equivalent to 1.22 pounds of separate rubber and friction tapes.

The air-curing quality of the rubber compositions used produces a permanently insulated splice as the tape cannot be removed without destroying it. The tape cannot be stretched and it therefore insures uniform thickness of insulation and dielectric resistance.

A resistance of 8,200 volts is claimed when one layer of this tape overlaps the preceding layer by one-third its width.—Dexter Rubber Corp., 2 West 45th St., New York, N. Y.

Hycoe Car Mats

THE Manhattan Rubber Mfg. Co., Passaic, N. J., maker of Hycoe automotive products, announces a new item in Hycoe car mats. They come in two sizes,



New Hycoe Automotive Product

Senior and Junior. The Senior mat measures 37½ inches top by 43½ inches bottom by 40 inches deep and the Junior measures 34 inches top by 39½ inches bottom by 32½ inches deep. Both sizes come in grades "A" and "B."

Hycoe car mats combine the best in workmanship and material and are packed in individual boxes.

Utilizing Inner-Tube Scrap

RUBBER wrapping bands made of inner-tube scrap, such as Utility Bands, will be found useful in many establishments. For the better grade bands, new factory auto inner-tube scrap is the base of the product. Where cheaper bands, however, can be used to advantage, such as newspaper carriers service, fac-

tory-scrapped or adjustment tubes prove profitable. Utility Bands are made in gray or red and in two standard sizes, packed in one-pound net-weight containers.

These bands offer a great outlet for the vast volume of factory-scrapped and adjustment inner tubes, which for this purpose command a price higher than scrap rubber.—Industrial Products Co., Alliance, O.

Industry and Trade

Report of the National Industrial Conference Board

Automobiles

THE falling off in the output of automobiles in June as compared with May was seasonally larger than that experienced in May as compared with the all-time record output of April. The April-to-May decline amounted to about 6 per cent, while the May-to-June declines amounted to some 9 per cent. Nevertheless, the estimated June output of approximately 578,000 cars, trucks, and busses was in line with the trend of the preceding months and was the largest June output on record. It exceeded the output of June, 1928, by 36 per cent. For the first six months of the year, therefore, the output, amounting to over 3,400,000 automobiles, was the largest for any similar period and was 47 per cent larger than the output of the first six months of last year.

Yet there is no indication that the market is in any way glutted. New car registrations have so far kept pace with the output, having increased 45 per cent during the first five months of this year over the corresponding five months of last year. Foreign sales increased 65 per cent, cars 47.5 per cent, and trucks 132 per cent. During the first five months of this year, exports claimed 18.6 per cent of the total output of automobiles; during the same period last year they took 16.8 per cent of the total output. From current reports, the July figures are not likely to alter this picture to any extent.

Crude Rubber

The consumption of crude rubber has followed the increased production of automobiles, and both consumption and importations have been of record volume. The June consumption of rubber was considerably below the record consumption of May, but was nevertheless larger than for any June on record. As estimated by the Rubber Manufacturers' Association, consumption during June amounted to 43,228 tons as compared with 49,233 tons in May this year and 37,675 tons in June, 1928. For the first six months of the year the industry consumed the record amount of 269,258 tons, which compares with the 211,573 tons consumed during the corresponding period last year and the 202,060 tons consumed in the corresponding period of 1927.

June imports of 44,500 tons compare with the imports of June a year ago amounting to 25,800 tons, and imports for the two corresponding six months' periods, ending June 30th, were 318,500 tons and 212,500 tons respectively. May imports this year amounted to 49,180 tons.

In spite of the fall in consumption, therefore, stocks of rubber on hand and in transit at the end of the month were by more than 5,000 tons smaller than at the end of May. This follows a corresponding shrinkage of 10,000 tons during the preceding month.

Pneumatic Tires

Production of pneumatic casings of all types reached a new high in May, being approximately 96,000 casings larger than during the preceding month, which was the record to date. Shipments, on the other hand, were some 82,500 casings smaller than during the preceding month, so that there has been a further increase in stocks, now amounting to the record total of 13,386,440 units. The latter, however, is said to be in keeping with the usual seasonal increase in stocks in anticipation of larger sales during the summer months.

Cotton Fabrics

Sales and shipments of staple cotton cloths during June showed a seasonal decline, the volume being less than production. Ratios of sales and shipments to production were less than in June of last year.

In line with seasonal trends stocks have gradually increased and are the heaviest since last October, but are substantially under June of last year. In the past six months the staple fabrics have shown a decided improvement compared with the same period last year. For the first half-year the ratio of shipments to production has amounted to 99.5 per cent, compared with 93.5 per cent in 1928 and the ratio of sales to production has amounted to 93.5 per cent compared with 89.0 per cent last year.

Raw Cotton

Consumption of raw cotton by American mills in June, amounting to 570,000 bales, was seasonably smaller than the amount consumed in any of the preceding months of the year, but was nevertheless relatively heavy, being higher than the June comsumption, with the exception of 1926, for several years. For the first six months of the present year the consumption of raw cotton has been only 1 per cent less than the 1927 consumption which was the highest ever recorded.

Gasoline Consumption

The output of petroleum continues unabated. For a number of weeks now, each week has disclosed an average daily output larger than that of the preceding week. At the end of May, stocks of crude petroleum amounted to over 408,000,000 barrels, an increase of over 23,000,000 since the beginning of the year. Gasoline stocks at the end of May were 5 per cent smaller than at the beginning of the month, but were over 16 per cent larger than on the same date last year. However, gasoline consumption during May was greater than ever before, being at a rate of 1,270,000 barrels daily.

Radium Averts Factory Fires

Radium is used in the Russian State Rubber Factory, "Treugolnik," in Leningrad to reduce fire risk, and, according to *Science Service*, it is cheap and effective, and the capsule of rare metal should last for ages. It is explained that when rubber solution is spread upon a fabric base and dries upon it, enormous charges of static electricity are produced from friction of the rubber-covered fabric against parts of the drying machinery. In time the pressure of these accumulated charges is raised so much that a breakdown through a discharge becomes inevitable. As air in the drying room may contain a high percentage of explosive vapor, an electric spark may do serious harm. Ordinarily the charges of electricity are led away, before their pressure becomes too high, a fine wire brush being used to collect the charges. Still there is always the danger of too high a concentration of either vapor or electricity, or of both.

Inasmuch as radium rays ionize the air and make it a good conductor, the metal is placed near the point where electricity is generated, and dangerous charges then flow harmlessly through the air to the nearest metallic part and thence to earth. One milligram of radium is said to be ample to ionize the air.

W. Rogowski and R. Tamm (*Arch. Electrotech.*, 20, 107-14, 1928), however, in comparing the effect of light from a mercury lamp and radiation from radium on the potential to produce a spark between metal electrodes in air, have found that the mercury lamp has an ionizing effect quite as good as even 7 milligrams of radium, both being set about 10 centimeters from the spark gap position.

Non-curing Pure Rubber

Rubber that has been purified, as by the Pummerer alkali method, may, according to Ernst A. Hauser, be completely relieved of all traces of nitrogen (the amount of which depends upon the age and source of the latex) by subjecting it to acetone extraction, then to ether diffusion, and then to a final acetone extraction, which also removes any oxygen trace. While the resulting chemically pure rubber hydro-carbon is of much academic if not practical interest, it does not cure to a soft rubber compound or give a vulcanizate of any commercial value without an accelerator. It may, however, be slowly transformed into ebonite.

Editor's Book Table

New Publications

The Cleveland Liner & Mfg. Co., 5508 Maurice Ave., Cleveland, O., issues each month blotters of typical blue color for advertising purposes, bearing the company trade-mark, "Climco." The slogan for this month is "Borrow trouble and you pay a high rate."

"Crepe Rolling" is Bulletin No. 50 of the Rubber Research Scheme (Ceylon), by its chemist, T. E. H. O'Brien, M.Sc., A. I. C., Peradeniya, March, 1929. This little paper booklet of 30 pages contains a fund of information on crepe rolling, amplified by tests, tables, and formulae. There is also a brief bibliography.

"De Laval Pumps and Turbines at Toronto" is an attractive 4-page, 2-color leaflet issued by the De Laval Steam Turbine Co., Trenton, N. J. It describes briefly and illustrates with several photographs the De Laval installations in the $14,000,000 addition to the water-works system of the City of Toronot, Ont., Canada.

"The R M A Manual of Tire Repairing" is now available in a revised, third edition, issued by The Rubber Manufacturers Association, New York, N. Y. "The purpose of this manual is to help the repairman turn out repairs that will build 'customer-confidence' in his skill and workmanship, and increase his value as an all-around, experienced tire man." Paper, 7 by 10 inches, 64 pages. Illustrated.

"Quality of the Cotton Spun in the United States, (Year Ending July 31, 1928)" is a preliminary report by Peter M. Strang, Senior Cotton Technologist of the Department of Agriculture, Bureau of Agricultural Economics, Division of Cotton Marketing, Washington, D. C., June, 1929. This 16-page paper booklet contains a fund of information, supplemented by several tables, treating of the production and consumption of cotton. Special reference is made to the tire industry.

"The Gyro-Sifter" in all its several types and adaptations is described in this 32-page catalog issued by Robinson Mfg. Co., Muncy, Pa. The primary purpose of the Gyro-Sifter is to mechanically produce accurate and distinct separations of materials by passing the mass over screens having uniform openings. These openings or meshes may range from 2 to 250 per lineal inch depending upon the type of product and on the amount and size of the products desired.

"The Rubber Exchange of New York, Inc., By-laws and Rules" has been issued recently in a new edition by the Rubber Exchange. It is a handsome book in loose-leaf form, bound in composition rubber covers, 5¾ by 7¾ inches. Its contents include: Officers, Governors, Committee Members; Charter; By-laws; Trading Rules; Delivery Rules; Commission Law Rules; Rules Governing Arbitration: Index; and Clearing House By-laws and Rules.

"The TAG Rubber Catalog." This catalog No. 901A of the C. J. Tagliabue Mfg. Co., 18 to 88 Thirty-third Street, Brooklyn, N. Y., comprises within its 64 pages profusely illustrated descriptions of the various Tagliabue instruments and their installation for the control of rubber manufacturing processes. Charts, tables, and diagrams add to the value of this attractive booklet. Separate sections are devoted to Air Operated Controllers; Steam Operated Controllers; Recorders; Industrial Thermometers; and miscellaneous accessory equipment of special adaptation.

"Ramifications" of 'Hallowell' Steel Shop Equipment" is a 4-page circular recently released by the Standard Pressed Steel Co., Jenkintown, Pa. The circular consists of photographs with brief descriptions of "Hallowell' steel benches, desks, and tables adapted to a wide variety of industrial uses.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
1234	Manufacturer of ear stopples for swimming.
1235	Manufacturer of "Cyco Dr."
1236	Manufacturer of dipping machines for use in making toy balloons.
1237	Source of supply of "Velumoid."
1238	Source of supply of Cerosite.
1239	Manufacturer of Leathersteel mats.
1240	Manufacturer of cocoanut oil soap used for a mold treatment for molded rubber goods.
1241	Manufacturer of embossing plates for rubber mats.
1242	Manufacturer of "Cabtyrit."

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country	Purchase or Agency
39,124	Shoes	Hamburg, Germany	Agency
39,130	Buttons	Nottingham, England	Purchase
39,133	Heels	Hong Kong, China	Purchase
39,140	Canvas shoes	Vienna, Austria	Agency
39,143	Sporting goods	Vancouver, Canada	Agency
39,151	Balloons and specialties	Montreal, Canada	Agency
39,161	Cotton-covered hose	Santiago, Chile	Purchase
39,271	Shoes	Copenhagen, Denmark	Both
39,272	Bathing caps and specialties	Amsterdam, Netherlands	Agency
39,294	Hose	Amsterdam, Netherlands	Purchase
39,302	Bathing caps and shoes	Koenigsberg, Germany	Agency
39,380	Crude rubber	Hamburg, Germany	Purchase
39,381	Shoes	Milan, Italy	Purchase
39,382	Soles	Cluj, Rumania	Both
39,409	Rollers for washing-machine wringers	Hamburg, Germany	Purchase
39,520	Druggists' sundries	Santiago, Chile	Agency
39,553	Tires and tubes	Budapest, Hungary	Both

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
2365	French Tire Exports During April, 1929.
2366	French Footwear Exports During April, 1929.
2369	Swedish Auto Tire Report for 1928.
2370	Philippine Tire Report for 1928.
2372	British Exports of Automobile Tires and Inner Tubes, First 3 Months, 1929
2377	Rubber Division Special Circulars, First Quarter of 1929.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Electric H. & R.	Com.	1½% q.	July 15	July 8
Electric H. & R.	Com.	1% ex.	July 15	July 8
Faultless	Com.	$0.50 q.	Oct. 1	Sept. 17
Faultless	Pfd.	1¾% q.	Oct. 1	Sept. 17
General	Com.	$1.00 q.	Aug. 1	July 20
Hood	7% Pfd.	1¾% q.	Aug. 1	July 22
Hood	7½% Pfd.	$1.87 q.	Aug. 1	July 22
Hood Rubber Products	Pfd.	1¾% q.	Sept. 1	Aug. 20
Manhattan	Com.	$0.75 q.	July 31	.....
Mohawk	Com.	$0.75 q.	Aug. 20	Aug. 5
Mohawk	Com.	1% stk.	Aug. 20	Aug. 5
Plymouth	Pfd.	1¾% q.	July 15	.....
Thermoid	7% Pfd.	1¾% q.	Aug. 1	July 19

Tubes for Garters and Suspenders

After being used for supporting tires, inner tubes are used for supporting stockings and trousers. Japan especially imports from American scrap-collectors a large quantity of discarded tubes, the better grade of red stock being employed in making a good reclaim, but a considerable amount of red, as well as a great part of the gray tube material, is cut up into garters and suspenders, which find ready sale at a low price among thousands of peasants.

The Rubber Industry in America

OHIO

President P. W. Litchfield of The Goodyear Tire & Rubber Co., Akron, O., announces that a site for a South American plant would be acquired. He said: "On account of the fact that two competitors have acquired sites in the Argentine and due to the difficulty of obtaining suitable sites, Goodyear has decided to obtain a site in the Argentine, looking to the future. No definite decision has been reached regarding building."

The Republic Rubber Co., Youngstown, O., on July 16 announced with deep regret the resignation, which took effect immediately, of its president, J. H. Connors. No announcement of future plans was made except that Mr. Connors was leaving for a vacation in the East. He has been the central figure in the forward progress of the company since he went to Youngstown with the late E. H. Fitch in 1922.

On July 17 at a meeting of the board of directors of the Republic company O. S. Dollison, sales manager, was elected a director and vice president in charge of sales. Mr. Dollison has been prominent in the rubber industry for the past twenty years and has been active in the direction of the Republic affairs since 1922.

Employes of the **Trump Bros. Rubber Co.**, the **Rubber Recovery Co.**, both of Akron, and the **Eclat Rubber Co.**, Cuyahoga Falls, all in O., held their annual outing at Meyers Lake on July 13. Mr. and Mrs. Henry Klingenhagen were winners in the popularity contest sponsored by the park management. L. M. Johnson, superintendent of the Trump Bros. Rubber Co., was general chairman of the affair, which was a very enjoyable event.

Tri-State Rubber Co., formerly of 1126 Belvedere St., Cincinnati, O., has announced the removal of its offices to 430 Reading Road near Central Parkway in the same city. The company, of which E. B. Engelbeck is manager, conducts a general wholesale, industrial, and distributing business in mechanical and rubber specialties.

T. A. T. Line Opens at Port Columbus

Ford, Firestone, and Other Notables Look On as Coast-to-Coast Train-Plane Service Starts from Port Columbus

Simultaneous with the dedication of Port Columbus, the Ohio State capital's municipal airport, on July 8, was the inauguration of the 48-hour coast-to-coast air-rail service of the Pennsylvania and Santa Fe railroads and the Transcontinental Air Transport, Inc. Henry Ford and his son, Edsel; Harvey Firestone and three of his sons, Harvey Jr., Leonard, and Raymond; Gov. Myers Y. Cooper; David Ingals, Assistant Secretary of the Navy in charge of Aeronautics; Elisha Lee, vice president of the Pennsylvania Railroad; Colonel Paul Henderson of T. A. T.; and other officials were present to greet Miss Amelia Earhart and other passengers as they alighted from the New York train at the field and entered the Ford tri-motor transport planes of T. A. T.

The "Firestone," the new tri-motor Ford plane of the Firestone Tire & Rubber Co., Akron, O., flew to the inauguration services with officials of the company, taking dealers in the Columbus territory and prominent city officials attending the dedication for short hops about the city.

George W. Sherman, machinery broker and original dealer in used rubber machinery, Akron, O., announced on July 6 that he has assembled all of his equipment in the warehouse formerly used by the Standard Textile Co. on Sweitzer Ave. Valuable equipment is listed with Sherman, where he does not purchase it outright. He frequently buys equipment where industrial plants close down and his machinery display includes every conceivable kind of device from the accessories of a boiler house to those of the electric power room.

He is frequently called in as special counsel on industrial salvage problems and is president of the Akron Industrial Salvage Co.

P. H. Hart, formerly treasurer of The Goodyear Tire & Rubber Co., Akron, O., will soon become vice president of General Investment Co., a subsidiary of the General Tire & Rubber Co., also of Akron.

P. E. Welton, formerly with the McMyler Interstate Co., Bedford, O., who had been manufacturing special rubber machinery for him, has become affiliated with the National-Erie Co., Erie, Pa., who will manufacture that type of equipment under his patents. He will be in charge of the Akron office, 414 United Bldg., Akron, O.

W. H. Collins, formerly of the Bethlehem Ship Building Corp., has been named superintendent of the Goodyear-Zeppelin Corp., Akron, O., according to a recent report of P. W. Litchfield, president of The Goodyear Tire & Rubber Co. In his new post with the airship corporation, Collins will be an assistant of Dr. Karl Arnstein, vice-president of the Goodyear-Zeppelin Corp.

"City of Columbus" Taking Off on First Air-Rail Trip. General Nolan, Henry Ford, Governor Cooper, Harvey S. Firestone, Edsel Ford, and Harvey S. Firestone, Jr., at the Dedication Ceremonies

Harvey S. Firestone, Jr., has recently been named a director of the National City Bank, Akron, O. Action was taken by the board of that institution following the decision of the stockholders to approve plans for the merger with the First Trust & Savings Bank, also of Akron.

The **"Vigilant,"** fifth of the dirigible fleet of The Goodyear Tire & Rubber Co., Akron, O., has recently been put in service. It is more luxurious than its sister ships and is equipped with two Warner Scarab motors of 110 h.p. each.

William M. McConnell, former Continental airmail flier, has been retained as pilot and **Larry Bell** as mechanic for the Ford tri-motor airplane of the Firestone Tire & Rubber Co., Akron, O. McConnell has just completed an extensive course in the flying of multi-motored planes at Detroit and ranks among the ten leading pilots of the nation on a basis of hours in the air. His official log shows that he has spent 5,400 hours in the air during the past twelve years and has flown every type of land and sea plane. Bell, the new mechanic, has been with the Stout Metal Airplane Co., Dearborn, Mich., for five years and is considered one of the most competent men trained at that place.

Mohawk Rubber Co., Akron, O., has asked bids on a general contract for a three-story and basement addition, 75 by 100 feet, to cost about $135,000 with equipment.

Dayton Rubber Mfg. Co., West Riverview Ave., Dayton, O., will build a two-story addition, to cost about $150,000 with equipment. J. A. McMillan is president.

Erie Foundry Co., Erie, Pa., has announced the removal of its Akron office to the Federal Gas and Oil Building, Akron, O.

The "Sky Fleet" is trying out its wings. Flying to and fro above the states in the Ohio Valley is the fleet of Aristocrat cabin monoplanes of the General Tire & Rubber Co., Akron, O. The Akron municipal airport is used as a base for the operations of the fleet since its return from Washington, D. C., where it was officially christened at Bolling Field by Miss Mary Fechet, daughter of Major General James E. Fechet, chief of the U. S. army air force, in whose honor the fleet's flagship, "General Jim" was named.

For the first time in the history of aviation, a commercial air fleet will fly into practically every state in the Union and into neighboring countries, sent by the General Tire & Rubber Co. to make observations and tests to aid the development of practical commercial aviation.

A. O. Johnson, son of the founder and president of the Medina Rubber Co., Medina, O., was shot and killed on July 4, when a shotgun in the hands of a companion was accidently discharged. Mr. Johnson and a party of friends were spending the day on the Johnson farm near Medina when the accident occurred. The charge from the weapon entered Johnson's chest, and he survived only a few minutes. As sales manager, the deceased was widely known throughout the eastern central states because of his contact with tire dealers and jobbers of tire accessories.

Stephen T. Miles, former assistant plant manager has been made plant manager of The Fairfield Rubber Co., Lancaster, O. Mr. Miles, has had nine years' experience with this firm, which manufactures rubber heels and soles under the trade name of Lantico. Prior to coming to Lancaster he had nine years' experience as laboratory assistant and calender-room foreman at the Hewett Rubber Co., Buffalo, N. Y.

E. C. Lowney has joined The Dayton Rubber Mfg. Co., Dayton, O., as credit manager. Mr. Lowney served India Tire & Rubber Co., Akron, O., in this capacity for the past five years, and for seven years prior to his connection with India was in the credit and treasury departments of the Firestone Tire & Rubber Co., also of Akron.

Akron-Williams Now in New Big Plant

To meet the increasing demand for Akron-Williams rubber making machinery, the Williams Foundry & Machine Co. Division of the National-Erie Co., Erie, Pa., has provided greatly increased manufacturing facilities. A new large factory has just been completed at Erie, Pa., on property adjacent to the steel foundries and gear plants of the National-Erie Co. The new building is of fire-proof construction, steel and brick, of the latest modern factory design.

New Plant of the National-Erie Co., Erie, Pa.

Besides enabling the Williams Foundry & Machine Co. Division to maintain larger production schedules on Akron-Williams equipment than ever before and to provide for further growth, the new plant is expected to make possible new economies in production and add further to the reputation for its exceptional value that Akron-Williams machinery has enjoyed in the past.

The Williams Foundry & Machine Co. Division of National-Erie is one of the oldest manufacturers of rubber machinery. For years its engineers have worked in close contact with tire and rubber manufacturers. They have developed many machines which have added to the efficient manufacture of tires and industrial rubber goods. Equipment built by this manufacturer is found in practically all plants of the industry. Such machines as tubers and tube molders have been rated by tire manufacturers as exceptionally valuable for maintaining constant high production. Other machines in this field include hydraulic presses, steam-jacketed molds, and heater presses.

Besides a complete line of rubber making machinery the company also offers full equipment for tire repair work, including every successful type of steam vulcanizer for steam vulcanizing by electricity, gas, gasoline, or coal. In addition the company's products include reducing shells, boilers, buffers, lasts, air-bags, and all other accessories or tools needed for tire repair work—everything necessary to provide a complete outfit for the repair shop.

Lindberghs Ride in Goodyear Blimp

Col. and Mrs. Charles A. Lindbergh made their first trip in a dirigible balloon on July 16 when they were guests of the Goodyear Tire & Rubber Co. of California at Los Angeles and took a ride over the city and environs in the company's airship "Volunteer." The start was made from the Grand Central Air Terminal at Glendale, western station of the T. A. T. line. According to Lieut. Karl Lange, pilot of the blimp, the Lindberghs enjoyed their ride thoroughly. The guests were given an unexpected thrill when the pilot "cut" the two motors of the ship and started them again with compressed air, an experience not easily duplicated on an airplane. The famous flyer took the controls of the ship for a while. J. X. Kennelly of the Goodyear company looked after the guests' comfort.

Auction of Wildman Tire & Rubber Co. Assets

All the physical assets of the bankrupt estate of the Wildman Tire & Rubber Co., Port Clinton, O., consisting of land, buildings, machinery, tools, equipment, furniture, etc., by order of John J. Killits, judge of the United States District Court for the Northern District of Ohio, Western Division, will be sold at public auction at Port Clinton on August 15. The land and buildings will be offered as a whole and also in separate parcels to suit bidders. Machinery, equipment, furniture, etc., will be sold piece by piece and will not be offered as a whole.

The plant is situated on Lake Erie, twelve miles from Sandusky, O., and is served directly by the main line of the New York Central Railroad. The plant as equipped at present has a capacity of approximately 1,200 tires and 2,000 tubes per day. The plant is of the most modern construction and layout and is equipped with machinery of the very latest type. The Wildman company had but a very short life so that its machinery and equipment is practically new.

Reorganization of The Falls Rubber Co.

Plans for the consolidation of the India Tire & Rubber Co. and the Falls Rubber Co., both of Akron, O., which had been contemplated for several weeks have been abandoned because some Falls stockholders did not favor the move. The matter did not come to a vote when Falls stockholders assembled to voice their opinion on the merger. They did, however, vote to enlarge the financial structure of the company and to carry on the business independently on a more enlarged manufacturing scale than in the past.

Among important executive changes that the directors ratified at their meeting on July 6 was the election of W. P. Cline as president to succeed R. P. Bremer, who becomes chairman of the board. Other officers are F. E. Dixon, vice president and assistant treasurer; and F. C. Holgate, who continues as secretary. S. L. Chubbuck remains in charge of sales.

Falls stockholders have approved additional financing with a $350,000 three-year note issue, the notes convertible into common stock at a rate of $7 per share. Par value of the preferred stock was increased from $25 to $100 per share and the total of authorized preferred shares was increased from 3,000 to 6,000 to be disposed of at the new rate. It was announced that the additional financing was handled entirely through stockholders of former record.

The new capital permits expansion of manufacturing facilities, particularly for additional equipment for the new "Roadmaster" tire, and will complete the factory set-up for making molded inner tubes in all sizes.

W. P. Cline ascends to the presidency after serving as treasurer for several years. Before joining the company, he was associated with Ernst & Ernst, certified public accountants in Akron. After serving as president since February, R. P. Bremer asked to be relieved to devote more attention to the retail tire business carried on extensively in northeastern Ohio through retail chain stores.

Gross sales and net earnings of the company for the first half of 1929 are far ahead of the same period last year, and the factory is behind with orders for the "Roadmaster" tire. With the installation of additional equipment the company will proceed on a new capacity production basis, it is stated.

Machinery Sales Engineer Wins Executive Position

Young in years but old in experience, the new sales engineer and representative of The R. H. Freitag Mfg. Co., Akron, O., seems destined now to achieve even greater success than he had in the past. He has had no extensive formal education, but he has accomplished more than many a college graduate.

V. A. Parker

After completing the courses of the Akron grade and high schools in June, 1902, Victor A. Parker joined the ranks of the working man. In April, 1903, his name was added to the payroll of The B. F. Goodrich Co. He remained with that organization until November, 1925, when, as mold engineer, he resigned to organize the Mohawk Sales & Service Corp., also of Akron. In December, 1926, as sales engineer and representative he became affiliated with the Bridgwater Machine Co., another Akron concern.

On May 1, 1929, The R. H. Freitag Mfg. Co., appreciative of this typical, modern American business man, was pleased to add him to its staff as sales engineer and representative.

The industry has benefited in more ways than one by his association, for Victor Parker was instrumental in the development of the forged steel tire mold and also the light-weight tire-building core manufactured by Bridgwater.

Mr. Parker is a native son of Akron, O., having been born there on November 13, 1886. He is also a member of the F. & A. M., No. 83; Grotto Yusef Khan; and B. P. O. E., No. 363; all of Akron.

His business address is that of the R. H. Freitag Mfg. Co., 1006 Grant St., Akron, O.

Tire Patch Manufacturers' Association, Inc.

First steps in the formation of a nation-wide association to represent the tire, patch, boot, and reliner manufacturers were taken in Akron, O., on July 8 when a representative group convened at Hotel Portage and elected officers who are to complete details for such an organization.

The new body is known as the Tire Patch Manufacturers' Association, Inc., and it is expected that a majority of the leading patch manufacturers in the country will be enrolled as members of the organization.

A. D. Fell, president of Gauer-Lawson Co., Chicago, Ill., served as chairman of the meeting, and George E. Blaylock of the Blaylock Manufacturing Co., Baltimore, Md., was named president. It was through the latter's efforts that the delegates met and carried out their plans to organize.

Other officers are: J. F. Rau, treasurer of Gauer-Lawson Co., vice president; and A. Buxbaum, of the A. Buxbaum Co., Akron, secretary-treasurer. The directors are: L. L. Oakes, Leo Meyer Co., Akron; A. D. Fell; L. H. Robinson, The Greenville Rubber Co., Greenville, O.; L. J. Barnard, Barnard Fabric Products Co., Danville, Ill.; and M. A. Goldberg, The Lowenthal Co., Akron.

The chief aims of the association as discussed at the meeting are to promote improved merchandising practices and to sponsor a campaign urging tire dealers and users to more extensive use of tire patches.

Officers plan to obtain articles of incorporation and to draft a constitution and by-laws, after which the date for another meeting will be set. Manufacturers interested in learning future plans should communicate with G. L. Blaylock, 2002 Oak Street, Baltimore, Md.

Goodyear Reports Record Half Year

The Goodyear Tire & Rubber Co., Akron, O., showed a net profit of $12,633,865 for the first six months of 1929, equal to $7.02 a share. This compares with $3,074,200 for the same period last year. The profit in the 1929 period is after deductions, which includes $4,855,039 for depreciation.

Net sales totaled $136,747,841, against $125,777,548 for the 1928 period, an increase of 8¾ per cent. Prices decreased between the periods and the figures represent an increase in volume of sales which is not indicated completely in the figures. The volume of business transacted in the 1928 period, however, was a high record for that time.

EASTERN AND SOUTHERN

Employes of the **U. S. Rubber Reclaiming Co., Inc.**, Buffalo, N. Y., recently acquired group life insurance protection through a policy issued by the Prudential Insurance Co. of America. The total amount of the policy involved is $377,000, covering 330 lives. The insurance is of the contributory type, each worker being insured in amounts ranging from $1,000 to $4,000, according to the rank or position held, and the premiums are shared by both the employing company and the workers themselves.

Dr. W. B. McCallum, chief botanist of the Intercontinental Rubber Co. and subsidiaries with headquarters at Salinas, Calif., has been visiting G. H. Carnahan, of the Continental Rubber Co. of New York, and Dr. William Crocker, director of the Boyce Thompson Institute for Plant Research, Yonkers, N. Y. Dr. McCallum is an outstanding authority on guayule shrub, having been associated with Intercontinental in its study and development for the past 19 years. He is returning home via Chicago where he will visit his Alma Mater, the University of Chicago.

The American Cyanamid Co., 535 Fifth Ave., New York, N. Y., has completed arrangements for the acquisition of the Selden Co. of Pittsburgh, Pa., bringing its recent mergers and acquisitions of chemical companies to four. Directors of both the Cyanamid and Seldon concerns have approved of this latest consolidation, it was announced, and the matter will now be laid before stockholders of the companies involved.

The Selden Co.'s assets, business, good will, and patents will be acquired outright by Cyanamid, according to officials of the latter company, which will turn over to the Selden stockholders 165,000 shares of its B common stock, equivalent at present market levels to approximately $8,745,000.

The Selden company's activities have been centered chiefly in the production of phthalic anhydride, of which it is the foremost producer, but it is also the owner of several valuable patents, including a process in which sulphuric acid is employed as a catalyst.

Innis, Speiden & Co., Inc., has announced the removal of its executive offices, together with the New York offices of its subsidiaries, Isco Chemical Co., Isco Bautz Co., and Wilbur White Chemical Co., to the Roebling Building, 117-119 Liberty St., New York, N. Y. Telephone: Cortlandt 5803 to 5810.

Automobile Production

June production (factory sales) of motor vehicles in the United States, as reported to the Department of Commerce, was 545,252 of which 452,641 were passenger cars, 91,296 trucks, and 1,315 taxicabs, as compared with 604,020 passenger cars, trucks, and taxicabs in May and 396,796 in June, 1928.

Albert A. Carthwaite, vice president of the Lee Rubber & Tire Corp., Conshohocken, Pa., was one of the score of passengers who left the Pennsylvania Station, New York, N. Y., on July 7, on the first regular scheduled westbound trip of the Transcontinental Air Transport, Inc., the 48-hour air-rail service between New York and Los Angeles. Colonel Charles A. Lindbergh in Los Angeles pressed the button that signaled the time for the departure of the train from New York. The next morning the passengers boarded two transport planes at Columbus, O.

The Omo Mfg. Co., Middletown, Conn., has announced the removal of its New York office to 150 Madison Ave., New York, N. Y. Telephone: Bogardus 4793.

Lewis Miller, one of the founders of Chautauqua, and one of the foremost citizens of Akron, O., in its early days, was the subject of an elaborate program commemorating his 100th birthday anniversary on July 24 at Jamestown, N. Y. Harvey S. Firestone, Sr., president of the Firestone Tire & Rubber Co., Akron, O., and the late Mr. Miller's daughter, Mrs. Thomas A. Edison, who lived in Akron until her marriage to the great inventor on February 24, 1886, were among the scheduled speakers for the celebration. Mr. Firestone, however, because of a light attack of pneumonia, was forced to cancel the engagement.

William C. Blake has been made manager of truck and bus tire sales of the United States Rubber Co., New York, N. Y., succeeding C. K. Whidden, who has resigned to take another position. Blake comes from the Kelly-Springfield Tire Co., where he had been manager of truck and bus tire sales for five years. He has had 19 years' experience with the rubber industry, including 9 years as a sales executive of The Goodyear Tire & Rubber Co. Before joining Kelly-Springfield, he was eastern manager for Dunlop products.

United States Rubber Co., New York, N. Y., through L. M. Simpson, general sales manager tire department, has announced the following appointment. H. A. Farr, for several years in charge of tire sales on the Pacific Coast, has been made assistant to general sales manager tire department, with headquarters at the general offices, 1790 Broadway, New York.

The United Carbon Co. has completed a new carbon black plant at Rock Creek, Tex., and is commencing construction of two others to be finished in September. This will bring its capacity to about 110,000,000 pounds a year, compared with actual production of 60,525,530 pounds in 1928 and estimated output of 97,000,000 pounds for 1929.

The Southern Acid & Sulphur Co.'s plant in Bossier City, La., is nearing completion. The first unit, which is now practically completed, was built at a cost of approximately $300,000. Headquarters of the company are in St. Louis.

Activities of the Rubber Manufacturers Association

The Tire Manufacturers Division met on July 11 at The Portage Country Club, Akron, O. The meeting was well attended, thirteen companies being represented. L. A. McQueen of The B. F. Goodrich Co. was elected chairman of the division and H. L. McClaren of the Ajax Rubber Co., Inc., was elected vice chairman, both to serve for one year.

The member companies elected to be represented on the Executive Committee of the Tire Division for the ensuing year are: Dayton Rubber Mfg. Co; Dunlop Tire & Rubber Corp.; Fisk Rubber Co.; General Tire & Rubber Co.; Goodyear Tire & Rubber Co.; Hood Rubber Co.; Kelly-Springfield Tire Co.; Mansfield Tire & Rubber Co; Michelin Tire Co.; Miller Rubber Co.; Mohawk Rubber Co.; Norwalk Tire & Rubber Co.; Pennsylvania Rubber Co.; Seiberling Rubber Co.; United States Rubber Co.

Among the subjects discussed by the division were a proposal for standardizing maximum cross-sectional dimensions of passenger-car super-balloon tires; a proposed interchangeable or combination tube program; the possibility of adopting a standard form of warehouse contract; and recent legislation affecting the tire industry.

The association office was also instructed to compile and report statistics covering the inventory, production, and shipments of industrial truck tires, as a regular separate report in future; such reports to be distributed to those companies which participate in the compilation of monthly figures.

The Tire Accessories and Repair Materials Committee held a meeting at the Akron City Club, Akron, O., on July 11, that was attended by sixteen representatives of twelve tire manufacturing companies. The committee requested the association in the future to collect and to report more detailed figures concerning the quarterly-sales value of tire accessories and repair materials. It is expected that publication of these figures will begin with the association's report for the third quarter of this year.

The Rubber Proofers Division held a meeting on July 8 at the Copley-Plaza Hotel, Boston, Mass., that was attended by eighteen representatives of eleven member companies.

On the following day, members of the Division were guests of the Plymouth Rubber Co. at a golf outing at the Pine Brook Valley Country Club. The Traffic Department has been successful in securing a change in packing specifications permitting the shipment of pneumatic tires in less than carload lots, unwrapped.

Goodyear's Gadsden Plant Formally Opened

The Goodyear Tire & Rubber Co. formally opened its $7,500,000 plant at Gadsden, Ala., at 11 o'clock, July 11, when President Herbert Hoover from Washington pressed a button signaling the hoisting of an American flag. Paul W. Litchfield, president of the Goodyear company, presided at the ceremony. On July 11 the plant started daily production of 5,000 tires. The factory has been in operation since June 21, when the first tire was built, production gradually increasing until it reached capacity.

The party that assisted President Litchfield in dedicating the new plant included C. C. Slusser, F. M. Harpham, C. A. Stillman, R. S. Wilson, vice presidents; Congressman Francis Seiberling and H. B. Manton, directors; P. E. H. Leroy, treasurer; W. D. Shilts, secretary; F. R. Wahl, counsel; J. E. Mayl, southern division sales manager; C. T. Hutchins, advertising manager; H. J. Carroll, traffic manager; C. C. Grant, engineering manager; A. G. Cameron, export manager; Ed Koken, Canadian superintendent; Ross White, manager at Buenos Aires; and Governor Bibb Graves, of Alabama.

The plant is the largest industrial development in Alabama in more than a decade. It will employ several thousand workmen and has a maximum daily production of 5,000 tires.

In addition to the factory, a large residential section has been added to Gadsden during the last four and one-half months, to house workers in the new plant. Sewer, water, and electric light connections have been made and streets and sidewalks constructed.

Scrap Rubber Rates Proposed For Gadsden, Ala.

Southern Freight Association Docket No. 45281 proposes to establish the following rates on scrap rubber, carloads, to Gadsden, Ala.: from Columbus and Dublin, Ga., 29½ cents and 33 cents, respectively. Submittal No. 45485 proposes to establish a rate of 37 cents per 100 pounds on scrap rubber (other than crude rubber) on old worn-out rubber boots, shoes, etc., having value only for reclamation of raw materials, minimum weight 30,000 pounds, from Cairo, Metropolis, Ill., and Paducah, Ky., to Gadsden, Ala. Submittal No. 45510 proposes to establish the following rates on scrap rubber to Gadsden, Ala.; from Huntsville, Ala., 24 cents.

Claude Hartwell, formerly Marathon sales representative, has recently been appointed sales representative in Mississippi and Alabama for the India Tire & Rubber Co., Akron, O. He will work from the Atlanta branch, covering the territory formerly handled by Fred A. Cook.

Firestone Service Stores, Inc., on July 1 at Miami, Fla., opened the largest one-stop service station in the world.

NEW ENGLAND

Revere Rubber Co., Chelsea, Mass., competing with 10 other factories in the United States Rubber Co. system, won first prize in a recent safety contest. Furthermore, one of its employes, Adam Jasinski, submitted the slogan, "Safety, a Monument to Industrial Progress," which won first prize, $50, in the country-wide contest. C. S. Ching, director of industrial and public relations of the United States Rubber Co., on behalf of its president, F. B. Davis, Jr., at a mass meeting of the employes presented the Revere factory with the banner marked "Safety 100%." During the safety contest the plant had not a single lost-time accident, and during the past six months it had but two.

The Goodyear dirigible, "Mayflower," presented to the Massachusetts Institute of Technology to be used by the students for experimental work, was landed on July 6 at Tech Field, Cambridge, Mass. Then the ship rose again with President Samuel W. Stratton, of Technology, and Paul W. Litchfield, president of The Goodyear Tire & Rubber Co., Akron, O., and president also of the Technology Alumni Association, as passengers. After a forty-five minute trip, the "Mayflower" returned, was refueled, and took off again to land Litchfield at his summer home at Green Harbor.

The Fisk Tire Co., Inc., Chicopee Falls, Mass., has made several changes of its executive personnel. A. F. Eggleston, formerly departmental head, has been appointed assistant to the executive vice president, Frank K. Espenhain. J. E. Mullaney, formerly assistant to Mr. Eggleston, is now departmental head. H. C. Hanson has been promoted to the position of assistant to the vice president in charge of manufacturers' sales. N. B. Brodhead has been named as head of the commercial department. All functions previously handled by Mr. Hanson as well as those presently handled by Mr. Brodhead will be unified under the latter.

F. L. Butler, who has represented The B. F. Goodrich Rubber Co., Akron, O., for the past fifteen years in eastern and northern Maine has changed his residence from Calais to Bangor to keep in touch with his trade and will reside at 28 Garland St., Bangor.

Firestone Service Stores, Inc., of Providence, R. I., is a reorganization of the Franklin Service Station, Inc., entailing increasing the authorized capital stock from 1,000 to 3,000 shares at $100 par, effected by the interests of Harvey S. Firestone, president of The Firestone Tire & Rubber Co., Akron, O. The new organization is a unit in the national chain of service stations being established by Firestone. Two stations are now located in Providence, and others will follow in that city and in other parts of Rhode Island.

Firestone Service Stores, Inc., of Providence, is headed by Victor D. Howard as president and trustee. Mr. Howard was formerly general manager of the Franklin Service Stations, Inc., and will continue as active manager of the new organization. R. M. Kimmell, of Akron, O., is secretary. The directors are: Mr. Howard, Mr. Kimmell, E. S. Graves and E. W. Shaw, both of Providence, and J. C. Harbert, L. T. Lyle, and V. N. Greer, all of Akron.

P. J. Conway, eastern sales manager of the Dryden Rubber Co., Chicago, Ill., attended the convention of horseshoers and blacksmiths, held last month in Bangor, Me.

Stamford Rubber Supply Co., Stamford Conn., according to William F. Gillespie, president, enjoyed a fair business up to June 1. Since that time, however, a decline due to overproduction has taken place. In consequence, the company has adopted shorter hours, and the outlook for June, 1929, will be far from comparable with the business during the same period last year.

Seamless Rubber Co., New Haven, Conn., according to its president, Fred O. Williams, has reported that during the first 5 months of 1929 business has run far ahead of its production for any similar period in its 50-year life. Although selling prices are low, volume is high, and the company is shipping more units. A 15 per cent increase, 200 employes, has been added to the payroll, and substantial additions to its buildings are now being erected. New machinery has been installed, and much money has been expended to make use of the latest discoveries of chemists and scientists in its field. A complete line of swimming goods has been added to its manufactures, and Seamless looks forward to continued unusually good business.

Hartford Rubber Works, Hartford, Conn., a division of the United States Rubber Co., engaged in the production of automobile and truck tires, has announced, according to L. B. Martin, superintendent, that production during the first half of this year has been substantially greater than that of the similar period last year. The company now employs more men than it did a year ago, and present indications point to continued high production throughout the remainder of 1929.

Goodyear Rubber Co. Making Good Progress

Goodyear Rubber Co., Middletown, Conn., although reorganized only about 3 months ago, is progressing most satisfactorily, and prospects are for a continued growth of the business, stated Charles M. Parks, treasurer. At present the company has 120 employes, having started with less than half that number, but expects to continue to add to its payroll. The town of Middletown attributes much of its present prosperity to the new Goodyear company.

NEW JERSEY

Midsummer finds all branches of the rubber trade in New Jersey in good condition and the outlook is satisfactory for the remainder of the warm season. Plants manufacturing tires are operating overtime, one concern running twenty-four hours a day. Orders for casings and tubes have increased considerably. The demand for rubber shoes as well as for soles and heels has also increased. Production of certain mechanical rubber goods and rubber cloth shows wonderful improvement. The hard-rubber situation also improved during the past month.

The United States Rubber Co., New Brunswick, N. J., has retired five of the employes of the New Brunswick office. The plant was closed several years ago, but an office staff was retained. Several employes, including James Deshler, age 80, have worked for the company for many years. Some of the office help will be kept until the plant passes to new owners. The India Rubber Co.'s plant and the United States Rubber Co.'s plant on Commerce Square are now on the market.

The United States company has protested to Governor Morgan F. Larson, of New Jersey, about lighterage at the Port of New York, claiming that its discontinuance would increase the cost of northbound freight. The letter to the governor states that the rubber company is decidedly concerned over the present agitation as it has plants in Jersey City, New Durham, Passaic, and New Brunswick.

The company said, "On northbound freight, such as cotton piece goods, etc., reaching New York, via the old Dominion and other steamship lines, we receive free lighterage delivery to Jersey City, the discontinuance of which would mean an additional cost of transportation."

The Murray Rubber Co., Trenton, N. J., has been awarded the contract by the State House Commission, Trenton, to supply tires and tubes for state touring cars. It was first stated that the United States Rubber Co.'s bid of $37,015.94 was low, but later it was discovered that a dedution of 2 per cent had not been made from the figure of the Murray Rubber Co. Less that amount, the Murray Co. bid was $36,349.95, bringing it more than $700 under the price of the competing company. The award to the United States Rubber Co. of the solid tire contract at $2.677 remains unchanged.

The Puritan Rubber Co., Trenton, N. J., was threatened recently with a serious blaze of unknown origin when a fire started in a pile of scrap rubber and damaged a portion of the office building. The company continues to operate to capacity in all the departments. Its business has nearly doubled during the first six months of the year. It is gradually adding new equipment.

Clifford H. Oakley, president of the Essex Rubber Co., Trenton, N. J., on July 13 entertained a number of guests on a cruise down the Delaware River on the Sea Scout Training Ship "Ballantrae." The guests were taken to Torresdale, Pa., where they witnessed boat races.

The Combination Rubber Co., Trenton, N. J., through A. H. Massey, general sales manager, announces that a "Certificate of Service" has been adopted as a protection plan for Viking tires and tubes. The "Certificate of Service" is somewhat different from other protection plans. It is said to give assurance that the service obtained from Viking tires will not be below a definite minimum. No premium is charged the dealer for this protection. If the tire fails to give the service for which it was warranted, the user is not asked to accept a repair job..

The Pocono Rubber Cloth Co., Trenton, N. J., is very busy and is operating with two shifts in each department. The company recently completed two one-story brick additions, and machinery for making rubber cloth is now being installed.

The Thermoid Company, Trenton, N. J., has awarded a contract for an extensive addition to the factory on Whitehead Road. New machinery and equipment will be installed. The building will be 100 by 170 feet, of brick, steel, and concrete and will be used for the manufacture of asbestos brake lining. The new addition will cost about $70,000 and will be in two sections. The company announces that business remains good in all departments.

The Hendrie Rubber Co., Trenton, N. J., has made application to the Secretary of the State of New Jersey for papers of dissolution. The company was incorporated under the laws of New Jersey several years ago and maintained a factory in California for the manufacture of tires and tubes. Thomas H. Thropp, former president of the Trent Tire Co., was at the head of the concern.

William H. Sayen, president of the Mercer Rubber Co., Hamilton Square, N. J., is on a lengthy trip studying business conditions throughout the Pacific coast and western states. The Mercer company is running normally.

The Luzerne Rubber Co., Trenton, N. J., manufacturer of hard rubber articles, reports that business continues good.

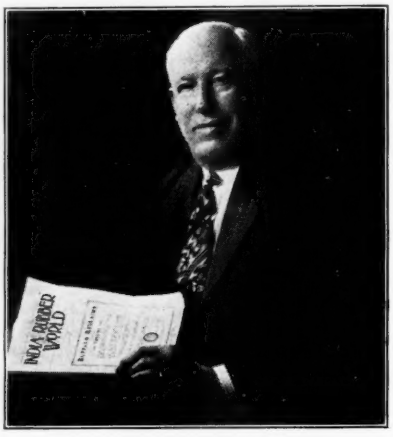
C. Edward Murray, Jr., president of the Murray Rubber Co., Trenton, N. J., has been spending some time looking after business in the Illinois section.

The Essex Rubber Co., Trenton, N. J., reports that business remains good with all departments operating overtime. The outlook for the present summer is very satisfactory.

Whitehead Bros. Rubber Co., Trenton, N. J., is busy operating overtime in producing belting and hose.

Pioneer Manufacturer An I. R. W. Reader

Seth R. Milbury, owner of the Neptune Rubber Mfg. Co. and its allied interests, Irvington, N. J.,—Neptune—the name is well chosen—has devoted almost his entire business career to the rubber industry, particularly to the manufacture of bathing accessories. Besides owning the Neptune Co., he organized and owns the National Rubber Mills of Irvington and N. Y., and is president of The No Tax Rubber Sole



Seth R. Milbury

Corp. and the Neptune Mat Co. He also holds 12 patents, all of which, except the first, which is mechanical, are related to rubber products. As one of the oldest manufacturers of bathing caps and accessories, Mr. Milbury has successfully built up a nation-wide business, and among his customers are some of the largest bathing establishments, including many of the municipal baths in the larger cities.

Several years ago he invented the neck and wrist rings so generally used. The international sales of these rings run into the millions. They are rust-proof and are guaranteed for two years. He has now patented a new ring made entirely of rubber. The number is worked into the rubber; thus the number will never be lost. When desired, the name of the bathing establishment can also be imprinted on the rubber. These rubber wrist bands are likewise guaranteed for two years although the average life is longer.

New Brunswick, N. J., may well claim Seth R. Milbury with justifiable pride, for he was born there in 1868. Thirty years later it was the locale of his wedding.

His education was supplied by the grammar school, Cooper Union, Pratt Institute, and Princeton. He is a member of the Class of '96, having received the degree of Bachelor of Arts.

The next year he started earning his living as a traveling salesman. In 1900 he went into business with his brother, still traveling, his territory including, besides New York State, the southern gulf and coast states. In January 1905 he began a business for himself, making bathing caps and mechanical rubber goods.

Mr. Milbury's address is 769 Stuyvesant Ave., Irvington, N. J.

PACIFIC COAST

Chanslor & Lyon Tire & Rubber Co., tire and tube manufacturer, 105th Ave. and Foothill Boulevard, Oakland, Calif., has discontinued the C. & L. line, and negotiations are being made with a syndicate of San Francisco capitalists to take over the factory and use it for manufacturing a general line of mechanical rubber goods. The plant was originally operated by V. K. Sturges Co. and later by King Tire & Rubber Co. The C. & L. Co. is a subsidiary of the Chanslor & Lyon Co., which operates a chain of automobile accessory stores on the Pacific Coast. The parent company has recently contracted to handle the entire Badger line of tires and tubes exclusively in California.

Pacific Goodrich Rubber Co. at its Los Angeles plant was scoring a daily average in mid-July of 5,700 tires and 6,000 tubes, and a much higher output is expected in the near future. Mechanical equipment is being steadily improved, and day and night work is the rule in nearly all departments. The company reports a steady increase in sales and installation of the Vulcalox rubber lining products for tanks, piping, etc., manufactured by the parent Goodrich concern in Akron. A recent visitor at the plant was T. G. Graham, first vice president of the Goodrich company in Akron. It was his first trip west of Denver and was made by air and rail from Columbus in record time. Mr. Graham was agreeably surprised at the progress being made at the Los Angeles plant and intimated that in the near future the company may add a fabric-manufacturing unit to the tire factory. He stated that almost the entire output of the Los Angeles plant is being marketed on the Pacific Coast and in the trans-Pacific fields, and said that the present force of 1,100 workers would probably be increased considerably in a short time. Cliff Taylor, manager of the Portland, Ore., branch, was also a recent visitor. General Sales Manager F. E. Titus spent a couple of weeks in July conferring with Goodrich executives in Akron.

New York Belting & Packing Co., according to Pacific Coast Manager A. H. Gregory, stationed in San Francisco, Calif., has been enjoying a good volume of business and notes that prices for belting and mechanical rubber goods generally are being well maintained despite competition. It is remarked that there is a tendency for buyers to be more conservative in the volume of their purchases than they were last summer. This commercial leaders attribute to uncertainty of interest rates on trade paper. An improvement is looked for as soon as the rather widespread speculative fever quiets down. In brief, many lines are expected to experience expansion as soon as a stable money market appears.

Kirkhill Rubber Co., 5811 S. Hoover St., Los Angeles, Calif., is working steadily on a 24-hour daily schedule and producing a large variety of standard mechanical rubber goods and specialties. General Manager T. Kirk Hill recently spent six weeks in the East buying presses and other machinery with which the company expects to soon speed up its output. Mr. Hill has replaced J. H. Best as secretary and D. Van Delzer takes Mr. Hill's place as treasurer.

Samson Tire & Rubber Corp., Los Angeles, Calif., is making rapid progress in the construction of its new $8,000,000 plant. Attention has been concentrated on the mills inasmuch as the company being crowded to capacity in its Compton and San Diego plants is especially eager to get into the new works. It is believed that sufficient headway will be made to permit major manufacturing operations to be started by August 15. Much of the heavy machinery is already installed. Included in the equipment are two of the largest Banbury mixers made. The steel for the six-story administration building is up and cement will be poured within a few weeks. The grounds and roads about the new structures are being rapidly put in condition. It is planned to employ about 2,500 workers and to make 6,000 tires and 10,000 tubes daily. Business continues to mount steadily with a notable increase in the Midwest, South, and East, as well as in the Pacific Coast field.

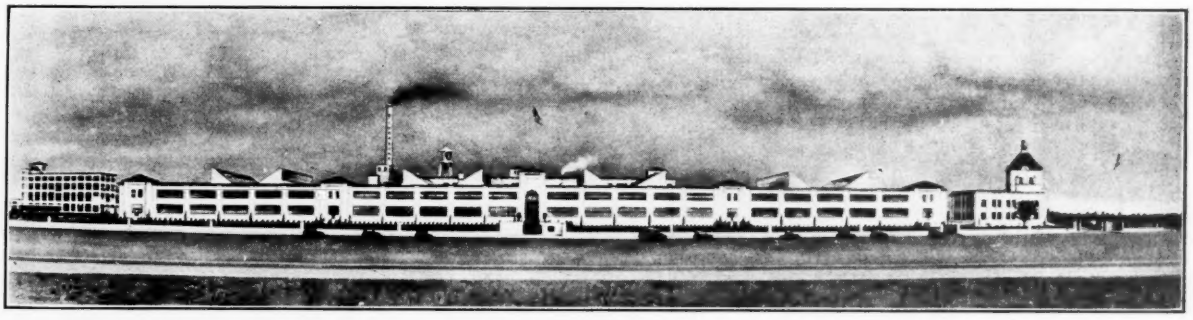
United States Rubber Co., through Pacific Coast General Manager J. B. Brady, announces the appointment of J. B. Magee as general manager of tire sales for the Pacific Coast. Mr. Magee succeeds H. A. Farr, who has long held that position at the San Francisco headquarters and who has been transferred to New York. Mr. Magee has been with the company 19 years, and for the past 15 years has been Los Angeles branch manager, a term said to be longer than that of any other branch manager for any of the major companies.

Huntington Rubber Mills, 1580 Macadam St., Portland, Ore., has been running steadily for many months on a 16-hour a day schedule in trying to keep pace with orders for heels, soles, buttons, bottle caps, and other molded rubber products. President Harry Huntington recently returned from the East and Midwest, where be made several important distributing connections.

West American Rubber Co., 400 N. Ave. 19, Los Angeles, Calif., is working double time executing urgent orders for high-test large capacity rotary hose for domestic and foreign oil fields. Sections of such hose are being used on one of the deepest oil wells in the world, over 9,000 feet, in the Long Beach, Calif., district. A new product is an all-rubber plug set for shutting off water in well drilling. Business is reported very good in standard mechanicals and specialties. A recent addition to the mechanical equipment is a 3A Banbury mixer.

W. C. Hendrie & Co., one of the large retailers of mechanical rubber goods in the Southwest, located at 405 Towne Ave., Los Angeles, Calif., has, according to President Hendrie, enjoyed during the past six months the best half-year's business in its history. Mr. Hendrie started as a jobber in Denver in 1906, handling the Republic rubber products and has been selling those goods ever since.

Firestone Tire & Rubber Co. of California is making headway fast in the doubling up of production capacity through the erection of new factory additions at either side of the present big structure, and the building of a 90 by 100 foot addition to the mechanical building and a 5-story storage and distributing plant. The new structures with machinery will involve an expenditure of fully $4,000,000. Two of the largest Banbury mixers will be installed. Having made about 1,000,000 tires in its first year, the company expects to turn out 3,500,000 in 1930. A Firestone service station is being erected in Phoenix, Ariz., at a cost of $250,000, and one is being put up in Fullerton, Calif., at a cost of $18,000. John W. Kerr, who had been Arizona representative and had latterly been assistant branch manager in Los Angeles, will have charge of the new Phoenix station.



ARCHITECT'S DRAWING OF THE FIRESTONE PLANT IN LOS ANGELES AS IT WILL LOOK WHEN ADDITIONS BEING MADE ARE COMPLETED

Decimal System

The National Association of Purchasing Agents in convention at Buffalo went on record as favoring the general use of the decimal system for designating gages of metal products. The resolution follows:

Inasmuch as there are numerous gage systems to designate metal sizes in more or less general use, resulting frequently in confusion, errors, and loss, and in spite of long use of these systems and their real value from certain standpoints, it is hereby resolved that the National Association of Purchasing Agents deplores the existence of these many systems, favors a sensible standardization of size description and therefore recommends the general use and popularization of the decimal system.

Pioneer Rubber Mills has announced the appointment of William R. Goudie as manager of industrial sales with headquarters at the general offices, 345-353 Sacramento St., San Francisco, Calif.

Goodyear Tire & Rubber Co., of California was averaging a production at its Los Angeles plant in mid-July of 12,000 tires and 10,000 tubes a day, according to Secretary H. J. Young. The entire factory is operated 24 hours a day. Assistant Sales Manager Waddell of the parent Goodyear company in Akron was a recent visitor. The company is putting up a branch building costing $70,000 in Salt Lake City at Fayette and Main streets.

Dayton Rubber Mfg. Co., Dayton, O., states that a new distributing concern, the Dayton Rubber Co. of Los Angeles, will dispose of its products in the Southwest. It will be located at 1500 S. Hope St., former headquarters of the Bayless Rubber Co., whose three stores have been taken over by the Great Western Tire Co., Los Angeles distributer of Fisk tires. The concern is headed by Jos. P. Schiller, long Pacific Coast manager for the Dayton company.

E. M. Smith Co., 637-639 Clarence St., Los Angeles, Calif., has just added to its belt-making equipment a press 5 feet wide by 30 feet long and installed a battery of new presses and other machinery for making a variety of general mechanical rubber goods. A new product for oil field work is a flexible rotary hose, which is said to have but two-thirds the usual weight and can stand 50 per cent more pressure. A particularly large-volume product is radiator hose. Large sales are also being made of brake lining and heavy conveyer belting for rock and cement mills. President E. M. Smith, who has taken an active interest in aviation as well as many other enterprises, recently bought an airplane for his personal use.

MIDWEST

Harold S. Falk, vice president and works manager of the Falk Corp., Milwaukee, Wis., has been appointed chairman of the Committee on Industrial Education of the National Metal Trades Association. During the last seven years he has been chairman of the Apprenticeship Committee of the Milwaukee Branch of this association. Under his direction apprentices in his district increased from 460 to well over 1,000. He evolved the principle that training engineers and mechanics for any industrial district is the joint responsibility of all manufacturers in the district and not of the individual manufacturer only. Accordingly, practically all metal trades manufacturers in the Milwaukee district are cooperating in this respect.

Mr. Falk is also a member of the Committee on Education and Training for the Industries of the American Society of Mechanical Engineers.

Kokomo Rubber Co., Kokomo, Ind., has announced its discontinuance of tire manufacture, the new factory now devoting itself to various automobile accessories in the rubber line. It employs about 250 workers.

Montgomery Ward & Co., St. Paul, Minn., on July 6 opened a chain of 10 tire and automobile accessory stores in Chicago, Ill. The move is the first in establishing multiple retail outlets.

C. L. Sowers, for the past 15 years branch manager at Grand Rapids, Mich., for the United States Rubber Co., will soon open a complete rubber jobbing store at 320 Ionia Ave., N. W., Grand Rapids.

Chicago Rubber Clothing Co., Racine, Wis., recently decided to open its own export department at Racine under the supervision of S. S. Brill, who was specially engaged for this department. He has had a long and varied experience in the export field and is well known in his particular work. The company invites inquiries which will be given Mr. Brill's attention.

Carter Rubber Products Co., 2231 Park St., Detroit, Mich., manufacturer of rubber sponges and miscellaneous rubber goods, will shortly erect a new plant unit on N. Oak St., Durand, Mich., which will be one-story high and cost over $40,000.

The National Tire Dealers Association in its meeting at Chicago, Ill., on July 23 announced plans for a $100,000,000 chain of retail tire stores to be known as the United Tire Stores Corporation of America. Details of the merger, which would combine several thousand independent dealers, is to be submitted to the membership of the association during its national convention in Chicago, November 11 to 14.

The Stauffer Chemical Co., 420 Lexington Ave., New York, N. Y., and 111 W. Washington St., Chicago, Ill., manufacturer of rubber chemicals, etc., has completed plans for the first unit of a new plant at Hammond, Ind., to be given over largely to the production of sulphuric acid. It will consist of several buildings reported to cost in excess of $350,000, including equipment, and is scheduled for completion by the close of the year.

The three-story concrete building at Thirty-Fifth and Hope Sts., Los Angeles, which will house the Pacific Coast Divisions of both the Fisk and Federal Rubber Cos., and the Los Angeles branch of the Fisk Tire Co., Inc.

CANADA

Rubber goods manufacturers state that the demand for garden hose has been so heavy this year that their stocks are depleted and at present in practically all sizes there exists an acute shortage. One manufacturer declared that his May sales were double those of the same month last year. Orders from dealers have been coming in during the last month in ever-increasing quantities, and it has been possible only to partly fill them. Manufacturers, unable to totally fill repeat orders, have had to divide the available supply of hose to the best advantage. One manufacturer said that had his firm been able to fill its orders for garden hose which came in, a record business would have been done this year. The warm weather this year favored this sales situation. However, a slowing up in demand is expected now as the usual heavy selling season closes with the month of July. Market conditions are steady and give no indication of changing, and prices are still without change.

The usual influence of seasonable summer weather is manifesting itself now in sales of sporting or outing footwear, and sales volume in this field is increasing daily. Rubber sheeting for camping purposes is also in good demand. Departmental and sporting-goods stores are advertising heavily rubber swimming floats. Rubber bathing caps, shoes, and other swimming requisites are likewise enjoying a heavy call, so prominent retailers say. Now that preserving time approaches, retailers are already selling rubber jar rings, the demand for which will be quadrupled as the coming season advances.

There is now one motor vehicle for every nine persons in Canada. For the first time registrations reached the million mark in 1928 with an aggregate of 1,076,819. This was an increase of 131,147 vehicles, or 14 per cent, over 1927.

Automobile production in Canada for the first five months of 1929 totaled 166,863, an increase of 70,000 over the figures for the corresponding period of 1928.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont. President and General Manager C. H. Carlisle following out his usual practice tells stockholders that sales in all divisions and territories show satisfactory increases over the same period for any previous year. Profits are satisfactory, and the company has borrowed no money during the year and has a considerable amount on call. The capacity of the new Toronto plant has been materially increased. The company has under construction in Saskatoon, Sask., an office and warehouse building ready for occupancy about October 1. The Bowmanville plant will also be expanded and the additions should be ready by the first of the year.

Lt. Col. A. E. Massie, D. S. O., Maritime Province Manager of the Dominion Rubber Co., Ltd., St. John, N. B., represented the entertainment committee of the St. John, N. B., Board of Trade in looking after recent visitors from the annual convention of the Canadian Manufacturers' Association at Halifax, N. S.

Lovell Caverhill Carroll, B. A., Montreal, P. Q., son of J. S. Carroll, sales manager of the mechanical division, Dominion Rubber Co., Ltd., is the winner of the Montreal Manufacturers' Graduate Fellowship in Economics and Political Science.

J. B. Inkpen, manager of the Halifax, N. S., branch of the Dominion Rubber Co., Ltd., returned recently from a most successful business trip to Newfoundland, the greater part of his time being spent in St. Johns. Mr. Inkpen says that the merchants he called upon there seemed satisfied with present business conditions and that they showed their confidence in the future by placing with him orders that were substantially larger than usual.

Bruck Silk Mills, Ltd., Montreal, P. Q., has secured the rights to manufacture and distribute in Canada a new chemically treated plant fiber, which has many of the qualities of linen but which can be produced and sold at prices substantially below those prevailing for cotton. The process is controlled personally by Isaac I. Bruck, president. The company at its Cowansville, P. Q., plant has already made considerable progress in manufacturing the fiber. The new "Fibruck" is adaptable to a great variety of products. Experiments are now being conducted toward its application in the production of automobile tire fabrics.

W. H. Miner, president, Miner Rubber Co., Ltd., Granby, P. Q., has been elected to the executive board of the Granby Board of Trade.

Eastern Rubber Co., Ltd., Acton Vale, P. Q. A petition in bankruptcy has been made on this company and a custodian is to be appointed.

Provincial Auto Licenses. Up to June 1, 19,000 more auto licenses than at a similar period last year had been issued. The 1928 total has now been exceeded, and with the corresponding increase in the consumption of gasoline the revenue from this source will be much more than in any other twelve months.

Firestone Tire & Rubber Co. When this American company started its radio broadcast at the beginning of December last, it was scheduled to stop at the end of May, but so numerous have been the requests from radio listeners throughout Canada and the United States that the firm decided to continue the concerts throughout the summer months.

One of the first flights of the $60,000 tri-motor monoplane of the American Firestone company was a recent good-will trip from Akron, O., to Hamilton, Ont., for the opening of Hamilton's new Municipal Airport. The plane made the 300-mile trip in 2½ hours and carried as passengers E. W. BeSaw, vice-president of the Firestone organization in Canada: W. H. Pade, Firestone's chief industrial engineer; E. P. McGuire, of the sales department; and C. L. Smith, superintendent of Firestone's Akron plant. This is the largest plane as yet landed at Hamilton.

W. A. Eden, president, Dominion Rubber Co., Montreal, P. Q., has announced several important changes in executive personnel by which an entirely new system is put into effect. The new plan now divides the company into three separate departments of tires, footwear, and mechanical goods. Each department has a general manager in complete control with departmental factory and sales managers serving under him. In addition there will be a general manager in charge of all shipping and service to customers.

To quote Mr. Eden: "The general manager of tires is to be completely responsible for everything to do with tires and will not be directly responsible for anything else. He has under him a tire factory manager and a general tire sales manager. The latter, in turn, has his own divisional sales managers, Eastern, Central, and Western. The other departments are organized in the same way."

The new general managers are: for tires, J. A. Martin; for footwear, G. W. Charles; for mechanical goods, W. M. Carment; for distributing branches, George Bergeron.

The new general sales managers are: for tires, M. L. Douglas; for footwear, J. H. Robertson; for mechanical goods, J. M. S. Carroll.

Good Buying Is Founded on Knowledge, Experience, Ability

"Good buying is an accomplishment that must be founded on knowledge, experience, and ability. A good buyer is not born; he is made. The making requires constant study of markets, materials, methods, and men. The purchasing agent who is successful is a diligent student of what he buys, its production and application and the economic forces that establish its value. That study is never-ending because materials and markets and methods change constantly and the purchasing agent must anticipate rather than merely follow these changes."—Albert M. Bowman.

Tandem-wheel Truck Equipped with Rubber Tractor Track

Tandem-wheel Tractor With Rubber Track

THE rubber tandem-wheel track here pictured applied over two tandem rear wheels of a truck was developed to meet a very essential need of the farmers, oil men, lumbermen, and fruit and produce growers to give them a light six-wheel unit with positive traction under abnormal road conditions at an extremely low initial cost. This improvement is effected by a six-wheel attachment that converts into a 4-ton truck a light duty 1½-ton truck of the Ford or Chevrolet type.

The rubber tractor is made of tire tread stock and cord. It may be carried on the truck like the usual non-skid chain. When mud, snow, or other bad road conditions are encountered, the track may be quickly installed like the non-skid chain, giving a caterpillar type of action and greatly increasing the tractive power. Tests have shown that the tandem wheel can be driven silently on highways at speeds up to 50 miles per hour.

This device was developed by J. F. Seiberling at the works of the Seiberling Rubber Co., Akron, O., for Tandem Wheels, Inc.

Giant Goodyear Tire

The Goodyear Tire & Rubber Co., Akron, O., has just built a standard pneumatic tire twelve feet high and measuring four feet in width for a prominent airplane manufacturer, who assured Goodyear officials that the day would come when larger airplanes will need a tire of this size. The largest tire in the world has just come out of the factory after being in the process of construction for three months. It is a standard tire in every way with the exception of size, an All-Weather tread balloon.

Something of the size of this giant casing can be gained by the fact that the tire and wheel weigh 1,800 pounds, almost one ton. The tread and wheel weigh 600 pounds each, and the inner tube tips the scales at 125 pounds. The tire, built under the combined supervision of the Chemical, Tire Design, and Research Divisions of Goodyear's Development Department, is mounted on a rim 4 feet in diameter, 30 inches wide. To inflate the tire to a pressure of 3 pounds, 45 minutes are required. The fabric weighs 150 pounds. For comparison it might be well to mention that an ordinary Ford tire weighs 15 pounds with tread about 7½ pounds. Thus, the figures show that this giant of the future has about 80 Ford tires in its carcass. The valve is the only item of standard size in the entire tire. A special vulcanizer was built around the casing to cure the rubber. Otherwise the tire was built under normal operations. Such a casing would sell for $5,000. This gigantic casing boasts of a load-carrying capacity of between 40,000 and 50,000 pounds.

Goodyear will display this giant of pneumatics throughout the country. It has been mounted as a trailer behind a bus of special design. The bus is built on a 2-ton chassis with 3 rows of seats in line with the great wheel. The top of the tire reaches twice as high as the bus, and is connected to the vehicle by two shafts. The bus and tire together have a "wing spread" of 30 feet.

Rubber Gaskets for Water, Steam, and Gas

APPARENTLY no service tests have ever been made upon the lasting qualities of rubber gaskets in contact with water, for the reason that deterioration is so slow as to make testing unnecessary. As a matter of fact, water lines with rubber gasket joints have never been known to fail because of disintegration of the rubber, where a good quality of gasket was used.

Where steam lines are jointed with rubber gaskets, the stock should be of a quality designed to vulcanize in place by the temperature of the steam transmitted; otherwise deterioration may be unduly rapid. Thin asbestos and rubber packing are specially suited for steam-joint and other high-temperature situations.

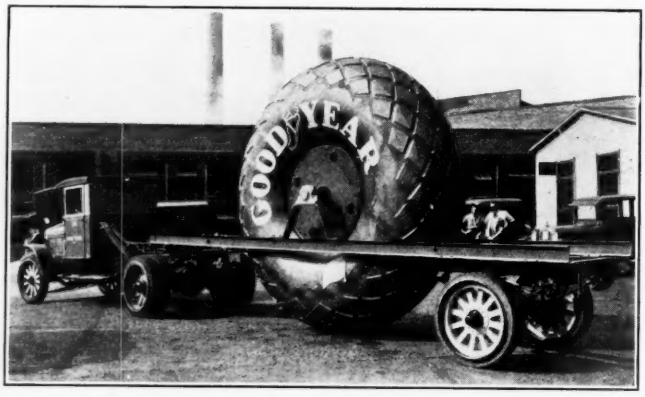
In natural-gas pipe lines, where the tip only of the joint ring may come in contact with the drip and condensate, rubber stocks can be suitably designed in composition and cure to give years of satisfactory service.

It may be said that for water lines, rubber gaskets of ordinary good quality are satisfactory, while for steam, gas, and oil lines special qualities only are suitable.

Carbon Black Output Increased Last Year

The carbon-black industry continued to set new high records in 1928, when new marks for both production and sales were established, the Bureau of Mines, Department of Commerce, stated May 31 with the announcement that production amounted to 248,790,000 pounds, an increase over 1927 of 50,361,000 pounds, or 25 per cent. Total sales for the year were 280,579,000 pounds, an increase over the previous year of 57,149,000 pounds, or 26 per cent.

The rubber industry is by far the largest consumer of carbon black and the major portion of the increase in output in recent years has been due to a comparable growth in the number of automobile tires manufactured. During 1928 the rubber industry produced about 75,000,000 automobile casings which, with a distribution of 140,938,000 pounds of carbon black, would indicate a carbon-black consumption of nearly two pounds per tire.



The Largest Tire in the World Built by Goodyear

The Rubber Industry in Europe

GREAT BRITAIN

Talk of Rubber Shortage

Talk of a rubber shortage in the near future is again in the air. There is a strong current of optimism noticeable and chairman of leading rubber companies seem on the whole to take a cheerful view of the near prospects for rubber. Thus Eric Miller points out that while the normal producing capacity of Malaya from present planted areas may be taken as 350,000 tons and that of the world at 725,000 tons, the evidence on the consumption side points toward contraction in world stocks which are considered to be none too ample at present.

Mr. Still, in the *Investors' Review*, once more expresses his belief in a shortage of rubber within a year. He criticizes the selling policy of rubber producers who, having produced regardless of market conditions, are underselling each other to an extent that may almost be termed ruinous.

Cyril Baxendale, speaking at a meeting of the Jugra Estate, in discussing present demand stated that if the present rate kept up, a closer relation between consumption and production might be hoped for in the near future. He found the greatly increased demand in England and other European countries most encouraging.

Lionel Rapson, tire manufacturer, sees rubber at 4 shillings a pound by the end of this year and the price of tires trebled within twelve months. He bases this conclusion on what he considers the appalling waste in rubber caused by scrapping thousands of perfectly good tires before they have rendered full mileage to owners of automobiles who are throwing tires away because new tires are so low priced.

In conclusion it is worth while quoting figures regarding Malayan shipments since the raising of restriction, as prepared by Messrs. Symington & Sinclair. According to their calculations the monthly shipments of Malayan rubber from November, 1928, to and including June, 1929, have been as follows:

November, 1928, 60,214 tons; December, 1928, 58,463 tons; January, 1929, 41,647 tons; February, 1929, 38,073 tons; March, 1929, 37,670 tons; April, 40,437 tons; May, 31,368 tons; and June, 1929, 28,665 tons.

Rubber Processes, Ltd.

Interesting details regarding Rubber Processes, Ltd., and the articles it produces have recently been published in the London *Rubber Age*.

The processes which the company uses are the inventions of P. H. W. Cloud, one of the most important being floor covering. It is claimed that the tendency to creep or spread, particularly in the thinner grades, has been overcome by the new flooring, which is supplied in a wide range of fast colors including plain and marbled effects. The material further has a mat finish which not only helps to prevent slipping, even when it is wet, but gives the colors a fine soft finish. The concern also produces mats and matting in the same quality as the flooring.

The manufactures are divided into two sections, hard and soft. Among the hard products are pulley covers, rollers for the textile trade, and wall and ceiling decorations. Seven years ago the firm made rubber rollers for the textile trade, which have been in constant use without having to be replaced, while during the same time leather-covered rollers have been replaced 24 times. The company produces also ebonite called Insulo.

Institution of Rubber Industry

Whitby Receives Colwyn Medal

Lord Colwyn, president of the Institution of the Rubber Industry, opened the Newton Heath Technical School, Manchester, of which the Rubber Trades School forms a part, on Monday, July 8. At a luncheon held on the same day Prof. G. Stafford Whitby, of the McGill University, Montreal, Canada, who was awarded the first Colwyn Gold Medal for scientific work, received the medal from Lord Colwyn.

According to the report of examiners on the candidates who took the associateship examination in science for Institute of the Rubber Industry diplomas, seven candidates participated, four sitting in Manchester, two in Birmingham, and one in London. The names of the candidates were given as: W. Hodland Bowyer; J. H. Carrington, B.Sc.; F. H. Cotton, B.Sc., A.I.C.; F. A. Jones; J. G. Robinson, B.Sc., A. I. C.; G. C. Russell; and E. O. Skinner, B.Sc.

None of the candidates received a grade of less than 70 per cent for the examinations. These results indicate that the diploma scheme is stimulating scientific and technical education and that the right types of candidates are presenting themselves for examination.

Sorbo Rubber Sponge Products, Ltd.

The Sorbo Rubber Sponge Products, Ltd., has acquired the business, British and foreign patents, and other assets of the Sponge Rubber Seat Co. Francis J. Walmsley, the chairman of the acquired company, will join the Sorbo board, and J. A. Howard, its managing director, has joined the staff of the Sorbo company as sales director.

GERMANY

Synthetic Rubber and Linoleum

Manufacturers of linoleum in Germany, it is reported, are realizing that rubber floor covering is a very serious competitor because of the superiority of the rubber article over linoleum, and they are investigating ways and means to improve their product. The use of natural rubber in making linoleum was not found practicable owing to the price. The hopes entertained for synthetic rubber have so far not been realized, but it is said to be quite suitable. The addition of not too large a proportion of artificial rubber to mixings greatly adds to the quality of linoleum, lincrusta, etc.

The I. G. Dye Works obtained an English patent in January for the manufacture of linoleum and lincrusta in which synthetic rubber is used. While linoleum produced from mixings to which synthetic rubber has been added shows a great improvement over other grades in which artificial rubber is not used, it is of course still inferior to rubber floor coverings as far as quality is concerned. It has been pointed out that as artificial rubber is steadily being improved, it is to be expected that it will find a wider use in the manufacture of other goods too.

Revertex for Fabric Belts

The advantages of using the concentrated latex known as Revertex for impregnating and rubberizing fabric belts are that the fabric needs no special treatment beforehand; that the fibers absorb the aqueous solution much better than a benzine solution, which naturally makes better adhesion of the layers, and finally Revertex vulcanizes more quickly.

The *Gummi-Zeitung* gives two formulae for mixings used for fabric belts in which Revertex is used: The first, for impregnating requires: 130 Revertex; 10 litharge; 10 casein solution 10 per cent; 0.15

Vulkacit P.; 0.05 Thiuram; 2 S.; 20 H_2O; 1 boric acid.

The second, for gumming, is as follows: 130 Revertex; 10 litharge; 20 mineral oil; 10 casein solution 10 per cent; 2 S.; 30 H_2O; 1 boric acid.

Technical Cooperation in the Cable Industry

Most of the German works producing electric wires and cables have decided to join a movement, the aim of which is to promote technical cooperation in the widest sense of the term in the wire and cable industry. The necessity for the industry to be able to work out and represent technical problems as a whole was becoming more and more apparent in view of the demands made by the development of the cable industry and its close relation with other departments of electro-technics. Naturally, this cooperative movement in no way affects the research work carried on by the various works individually.

Rubber in Whale Fishery

The formation of a German whaling company calls attention to whale fishing and the production of whale oil. There are two whaling ships in the harbor of Hamburg at present, where the whale blubber is worked into oil. The whales that have been caught are brought alongside these boats and are kept afloat by means of air that is pumped into them with the help of long rubber tubes measuring about 30 meters in length and having an inside diameter of 25mm. On the whale, which may weigh 200 tons, stand the men who cut up the body into convenient sections that are conveyed to the deck of the ship by means of a rubber belt 1,500 mm. wide and 15 mm. thick. When the oil has been extracted, it is led into tanks through rubber tubes 10 m. long. The waste is worked into fish meal, and for carting this material a number of electric carts or barrows are used which are furnished with suitably protected tires to prevent slipping on the greasy decks.

That whaling is still an active industry may be judged from the fact that within four months of this year no fewer than 1,400 whales were caught, and some 40,000 casks of whale oil, each containing 1,000 kilos of oil, were produced.

Inventor of Rubber Erasers

To Joseph Priestley, the honor is generally given of discovering that rubber would remove pencil marks, although Joao Hyacinthe Magellan, a descendant of the famous navigator, is also mentioned as the first to use rubber to erase pencil marks instead of bread crumbs customarily used up to that time. But Max Speter, in the *Gummi-Zeitung*, shows that neither Priestley nor Magellan was the original discoverer, but a London maker of instruments by the name of Edward Nairne.

Quoting from Priestley's "Familiar Introduction to the Theory and Practice of Perspective" the part where the instruments, "that are of use in the Practice of Perspective, and Application of them" are described, published in London in 1770, he shows that Priestley recommended bread crumbs for erasing pencil marks, but after the work had gone to the printer he added to the preface the following footnote. "Since this work was printed off, I have seen a substance excellently adapted to removing from paper the marks of a black lead pencil. It is sold by Mr. Nairne, mathematical instrument maker, opposite the Royal Exchange. He sells a cubical piece of about half an inch, for three shillings; and he says it will last several years."

So that apparently Edward Nairne, who lived in London from 1726 to 1806, must be considered the original discoverer of erasing rubber and not Priestley nor Magellan. The latter lived in London from 1763 to his death in 1790. It is usually claimed for Priestley that he made his discovery in 1770, while references to Magellan in connection with erasing with rubber date from 1772.

It is interesting to learn that erasing rubber was first sold in France in 1775 in the shape of small cubes which were known as *peaux de nègres*, that is, "nigger skins." In Germany, it seems that even as late as 1853 rubber as an eraser was a little known novelty, and Speter quotes an authority to this effect, although it should be mentioned that it was an ink eraser that was considered in this case.

RUSSIA

The recent technical reorganization in the Russian rubber industry has resulted in a marked improvement in general efficiency and an increase in output of manufactured goods. Nevertheless, the demand in Russia is said to be so great for rubber goods that despite the increase in production, in many respects the supply fails to cover the demand. During the last two years for which figures are available the output of rubber goods was as follows:

	1926-27	1927-28	Increase in 1927-28
Rubber footwear (pairs)	29,633,700	36,248,000	22%
Tires (number)...	294,000	532,000	81%
Other rubber goods (tons)....	5,674	8,500	50%

In 1925-26, 25,302,800 pairs of rubber shoes were manufactured. The increase in weight of tires was even greater than that indicated by the increase in number as in the meantime the factories undertook manufacturing large-sized tires for busses in greater quantities. Incidentally the increase in the manufacture of tires shows that the use of motor vehicles in Russia is making good progress.

The total value of the output of rubber manufactures during the period 1927-28 by the Russian Rubber Trust came to 171,000,000 rubles, against 150,000,000 rubles in 1926-27.

Methods of manufacture are constantly being improved. This is well illustrated by the fact that although wages underwent a rise, costs were reduced on an average about 15 per cent. It is hoped to cut costs still further and a reduction of 10-12 per cent during the coming year is expected. By far the greater part of the goods is made by the Treugolnik concern, which produced 70 per cent of the output last year, while the Bogatyr works produced 21 per cent. Rubber footwear included 68 per cent of all rubber goods manufactured during the year; tires accounted for 8.8 per cent; and other rubber goods for 20.6 per cent; while the amount of asbestos goods was 2.6 per cent.

The pre-war output of rubber footwear was exceeded in 1926-27, while in the period 1927-28 the increase as compared with pre-war figures came to 32 per cent. The population of the Soviet Union is estimated at 8 per cent above that in 1913 and on this basis it is calculated that the use of rubber footwear per head is now 25 per cent greater than it was in 1913.

As already mentioned, the Russian rubber industry has been introducing modern methods on an increasingly large scale. Thus in contrast with former methods, a large part of the work is now done by machinery; the work is largely specialized, and in various departments the conveyer method of work has been introduced. The saving effected by these means is amply illustrated by the fact that while the output of rubber shoes increased 22 per cent and that of tires 81 per cent in 1927-28, the increase in employes was only 11 per cent. The price index for rubber goods in the year under review, taking that for 1913 as 100, was 161 and it is expected that this will be further reduced.

The Soviet Rubber Trust is working to develop the rubber industry still further and plans the erection of a number of new factories; moreover it intends to erect a tire factory either at Moscow or Jaroslawl in the near future.

A problem confronting the rubber trust is the crude rubber supply, and for some time past scientists have been investigating various possibilities. Just now an expedition is considering creating a source of supply in the south of Russia. A group of scientists are conducting experiments in connection with the acclimatization of various rubber producing plants in the region of the Black Sea.

Exports of rubber goods from Russia have been increasing, and in 1927-28 the total exports amounted to 4,500,000 rubles. By far the greater part of the goods consisted of rubber footwear, the customers being Persia, importing the most, Afghanistan, Western China, Turkey, and Austria.

Belgium's Tire Exports

According to preliminary official statistics, Belgium exported 1,773,800 kilos weight of solid and pneumatic tires and tubes during the first quarter of 1929 as compared to 1,358,500 kilos weight in the same period of 1928. It is estimated that during the first quarter of 1929, 147,817 automobile casings were exported from Belgium, which compares with 113,208 for the same period of 1928. These estimates are based on the rate of one automobile casing being exported for about every twelve kilos weight of solid and pneumatic tires and tubes.

The Rubber Industry in the Far East

MALAYA

Rubber Facts and Figures

Interesting facts and figures regarding the rubber industry in Malaya are contained in a recently issued report, "Review of the Trade of British Malaya," by L. B. Beale, British Trade Commissioner.

Total exports of rubber from Malaya in 1928 came to 408,700 tons, or 37,000 tons above the 1927 figures. It is estimated that the above amount includes 120,000 (dry weight) tons from foreign sources. The imports of rubber into Malaya from the Dutch colonies for remilling before being reexported will continue to be heavy for some time, as native production is increasing in the Dutch East Indies, and there are no adequate facilities for handling and exporting to consuming countries large amounts of native rubber.

With regard to the outputs to be expected for the current year, the following estimate, which is in no way official but is based on the most reliable data available with full allowance for unrestricted production, is submitted:

British Malaya

Estimate of Potential Production, 1929

	A Tons	B Tons	C Tons	Total Tons
Federated Malay States	132,000	14,000	49,000	195,000
Straits Settlements	25,000	4,500	10,000	39,500
Unfederated Malay States				
Johore	40,000	4,500	28,000	72,500
Kedah	22,000	.....	7,500	29,500
Kelantan	4,500	.....	3,500	8,000
Trengganu	.....	.....	.....	1,500
Total old restriction area				346,000
Penang and Singapore (Approximate)				5,280
Total British Malaya (Approximate)				350,000

A—Holdings Over 100 Acres. B—Holdings of 25-100 Acres. C—Small Holdings Not Over 25 Acres.

As will be seen the estimated output from small holdings of less than 100 acres comes to about 125,000 tons out of a total estimated at 350,000, tons. The small holdings are for the most part in the hands of Chinese and are classified as native holdings. These native holdings therefore produce some 35 per cent of the total output of Malaya, a factor the importance of which should not be underestimated.

The combined dry rubber outputs of Malaya and the Dutch East Indies have been estimated by a reliable authority as follows:

	Tons	Tons
British Malaya		
Estate	225,000	
Native	125,000	350,000
Dutch East Indies		
Estate	150,000	
Native	120,000	270,000
Total		620,000

Native production for 1929 is therefore estimated at 40 per cent of the total output from the two sources. One thing that strikes the eye is that the native output of Malaya is slightly higher than that to be expected from the Dutch colonies. So much has been said about Dutch native rubber and in comparison so little mention has been made of the native output in Malaya that to the casual observer it must come as something of a shock to realize the extent to which the rubber industry depends upon native rubber from Malaya.

Imports of Rubber Goods

The chief imports of manufactured goods into Malaya are represented by tires and tubes. Out of a total amount of $6,323,548 expended by the colony on manufactured rubber articles, no less than $5,000,000 went for tires and tubes. In 1927, 23 per cent of these goods came from Canada, which the year before had supplied only 4 per cent and apparently nothing at all in 1925. On the other hand France which had supplied 42 per cent in 1925 dropped to 20 per cent in 1927. The United States shipped 20 per cent in 1927 against 32 per cent in 1926 and 31 per cent in 1925.

Special attention is called to the tires made locally. Production is not large as yet but it is considered that if local manufacture should prove successful, the aspect of the whole import trade would need revision. At present Malayan produced covers sell well below the imported brands, the comparative prices being as follows:

Cover Size	Retail Price Imported	Retail Price Local Product
29 by 4.40	$17.30	$14.50
26 by 3.50	14.00	10.00

The development of local manufacture is a feature which British tire manufacturers cannot afford to ignore, and it is suggested that if it should be found possible to make locally a serviceable tire at much below the cost of the imported article, British manufacturers would do well to give consideration to branch factories. Labor in Malaya is plentiful, fairly efficient, and relatively cheap. The nearby markets of the Dutch East Indies and Siam together with the Malayan market represent a volume of consumption that is already fairly substantial and would increase from year to year.

Secrecy Regarding Costs

Of late more and more rubber companies have formed the habit of withholding from the public the costs of production. Various reasons are given for the practice. Recently Sir Frank Swettenham expressed himself in sympathy with the policy because his company does not want to take any hand in misleading the public while trying to give information to shareholders.

The *Penang Gazette* expresses its surprise that a man of the experience and acumen of Sir Frank Swettenham should succumb to the practice.

"This secrecy is futile," it remarks. "Against whom is it directed? Surely not the United States which takes sixty per cent of the Malayan output. America has strong rubber interests in this country and in the Dutch East Indies and were every British rubber company to withhold its production costs, she would still be in a position to arrive at approximate figures regarding the costs of production of each and every estate. Where is the gain?

"The practice of withholding figures relating to the cost of production is fundamentally wrong, not only because the improvement of economic information is necessary for wise intervention or guidance by the state, but because it is essential to the efficient functioning of private enterprise. Individual businesses cannot pursue a correct policy if they are debarred in a general way from knowing what other businesses are doing. One of the greatest factors of inefficiency in commerce today is secrecy, particularly when the question of comparison with the United States arises."

The paper quoted closes its remarks by suggesting that this is a matter in which the government should take a hand and compel companies to give up the habit of withholding costs.

Rubberized Woolpacks

A subscriber to the *Malayan Tin & Rubber Journal* writes from New Zealand sending a newspaper clipping which refers to a new woolpack made of rubberized fabric. At present wool is shipped in jute fiber packs, with the result that the jute fibers get mixed up with the wool. Attempts have been made to produce a smooth surface pack which would prevent the mixing of the jute fiber with the wool. Now a London chemist, P. Finlayson, in collaboration with W. W. Gunn and M. D. Gunn, both of Australia, has invented a new woolpack made of jute fiber treated with a rubber solution. English wool spinners have approved of the new pack, which will have the added advantage of weighing less and not costing more than the usual pack. It is reported that M. D. Gunn is to leave for India shortly to arrange for the establishing of a factory at Calcutta to produce the new packs. One thousand of these packs will be ready at the end of the present wool season and will be used in trial shipments direct to Bradford, England.

NETHERLANDS EAST INDIES

Dutch Rubber Propaganda

Report of the International Association for Rubber

The Sixth Annual Report of the Propaganda Department of the International Association for Rubber and other Cultivations in the Netherlands Indies states that the industrial laboratory at Delft is investigating the use of rubber as a binding material for foundry cores, also that the use of rubber pads under rails is being tried out in Holland to ascertain whether they could replace the poplar wood plates used between the rail and sleepers. The results obtained will be used in testing rubber pads under car-tracks in Rotterdam with the idea of obtaining more durable construction and reducing the noise. Another subject of investigation has been the Casco buffer in which it is claimed that the rubber bar absorbs collision energy, thus diminishing damage.

Soling crepe is gaining in popularity in Holland, and more particularly the vulcanized type which is giving the leather trade cause for worry. Nevertheless it is estimated that in 1928 Holland used about 55 tons of unvulcanized sole crepe.

Concerning certificate rubber, which aims at uniform physical properties, tests show that little is left to be desired except in plasticity, which showed some variation for the different lots. Eventually certificate rubber will have to get a premium. At present the difficulty is the opposition of the manufacturers whose prime interest is to obtain the material as cheaply as possible.

The use of rubber flooring increased considerably during 1928, although the price acts as an obstacle to a more widespread use of the article.

The most important work carried out during 1928 was laying a section of rubber paving in the Scheepstimmermanslaam in Rotterdam. The section was completed on December 6 and opened for traffic on December 8. The area is 270 sq. m., the length being 33 m., and the width varies from 9 to over 8 m. The work was carried out by the Nederlandsche Basalt Maatschappy of Zaandam, and the North British Co. block used. It consists of a cap of resilient rubber 1 inch thick and a 7/8-inch thick vulcanite base with an intermediate layer of 1/8-inch between. The whole is anchored to a 2-inch concrete base molded to the block after vulcanization. To test the abrasion caused by traffic without having to remove blocks for the purpose, letters have been impressed in the upper layer to a depth of 0.75mm.

The bed of the road consists of a concrete foundation on which the blocks were laid in a layer of cement and sand, 1 inch thick, two parts of sand being used to one of cement. The joints between the blocks were filled in with a mixture of two parts of grouting material as used for granite sets and one part shelfalt H. At the time the report was published the road had been in use 5 months and was very satisfactory.

The cost of the paving is the most important problem. The Cresson block in which the base is of stone chips, the necessary fillers, and sulphur mixed with latex of plastic coagulum, presents two difficulties. If imported, the weight would make transportation costs too high, and if manufactured outside of the rubber-growing centers, the imported latex would add to transportation costs.

An investigation as to whether latex was indispensable in the base of the block showed that first latex crepe was in no way inferior to the base made with latex as far as compressive strength is concerned. The insertion of a perforated metal plate to make the base thinner was also successful so that additional reduction in costs may be obtained in this way.

Rubber Cultuur Mij. "Amsterdam," N. V.

The annual report of Rubber Cultuur Mij. "Amsterdam" N. V., shows that the total planted area of rubber is now 56,137 acres, of which 52,512 acres are in Sumatra and 3,625 acres in Java. The total productive area is 39,203 acres, and the total crop harvested during the last year came to 16,449,668 pounds produced at a price of 8.7 pence f.o.b. per pound. The Sumatra estates produced 14,865,460 pounds, or an average of 417 pounds per acre, while the Java estates yielded 1,584,208 pounds, or an average of 444 pounds per acre. The average over the entire area was 420 pounds per acre, against 383 pounds the year before.

The following forward sales out of 1929 crop were made: 7,954,000 pounds, average 1 shilling 2.4 pence per pound, net, including January/May deliveries, to General Rubber Co.; 3,582,000 pounds to General Rubber Co. at prices prevailing in London for standard sheet, with a minimum of 1 shilling 2 pence per pound, to be delivered June/December; 716,000 pounds to General Rubber Co. at prices prevailing in London for standard sheet, with a minimum of 1 shilling per pound, delivery June/December.

From 1930 crop: (a) 3,585,000 pounds at an average of 1 shilling, 3.3 pence per pound; (b) 695,000 pounds, delivery, c.i.f. main European port at prices prevailing in London for standard sheet with a minimum of 10 pence, and a maximum of 1 shilling 3 pence per pound, and if London prices advance beyond 1 shilling 5 pence per pound, one half the difference between the higher price and 1 shilling 5 pence to be paid the company.

From 1931 crop: (a) 2,094,000 pounds at average price of 11 pence per pound net; (b) 805,000 pounds on terms as under (b) for sales from 1930 crop.

From 1932 crop: (a) 2,432,000 pounds at an average price of 10.7 pence per pound net; (b) 805,000 pounds on terms as under (b) for 1930 crop.

From 1933 crop: (a) 1,567,000 pounds at an average price of 10.5 pence per pound net; (b) 672,000 pounds on terms as under (b) of 1930 crop.

Tapping Systems

In a recent issue of *Archief voor de Rubbercultuur,* Dr. J. Schweizer discusses the relation between production curves and the renewal of rubber and the connection with tapping systems in Hevea plantations.

Various investigators had shown that in periodical tapping, production reached a maximum after a certain time, when it dropped for good within that tapping period. Hoedt further investigated this phenomenon and worked out the conception of the economical tapping period. As a result of the work in this direction, various estates that had been in the habit of tapping every other month began to check up their average daily yields. Some found that the tapping period was too short, and in other cases varying results were obtained. In fact the production curve varied from period to period. Hoedt had already observed these phenomena, and to get around the difficulty, he used the average of a number of tapping periods determined in advance, as basis for the most economical period.

In his article, Dr. Schweizer takes up the subject of these irregularities in production curves in greater detail.

To begin with he points out that the withdrawal of latex stimulates the cells to renewed production. This renewal or regeneration process takes place regularly in tapped trees and is influenced by the manner in which the latex has been withdrawn. So it is to be expected that the tree reacts differently to different tapping methods, and that each new tapping system causes a different state of equilibrium between the withdrawal and renewal of latex.

A variety of internal and external factors influence the productivity of a tree and the flow of latex. A fairly satisfactory explanation, based on osmosis, has been worked out for the flow of latex in Heveas by Zimmermann and Arisz, but there is an important phenomenon that cannot be explained on the basis of osmosis alone. Arisz, for instance, showed that in latex production there is a periodicity that is independent of rainfall, soil moisture, and leaf. Many of the trees he observed gave markedly increased productions immediately before the wintering periods and in some cases the maximum production was actually reached when the trees were entirely bare of leaves. This led Arisz to the consideration that two factors play an important part in the latex flow. Namely, an internal factor that influences the renewal of latex and a process that attempts to bring the concentration of the latex back to its original level, as it was before tapping.

Leaving the question of concentration aside, Dr. Schweizer considers the factor of the secondary renewal of latex closely connected with the wintering of the trees and that it is a process that does not always take place at the same rate, as Arisz' production curves show.

Investigators of tapping systems will have to take into consideration these factors of more or less intensive secondary latex renewal.

Rubber Patents, Trade Marks and Designs

Machinery

United States

1,716,652.* TIRE-MAKING MACHINE. An improved mechanism for feeding a continuous web of material to a rotating member and laying the web thereon. H. I. Morris, Lakewood, assignor to The Cord Tire Machine Co., Cleveland, both in Ohio.

1,717,126.* GRINDING MILL. This mill is adapted to be adjusted to conform to various conditions under which vulcanized stock of solid rubber or used rubberized fabric is ground or crushed for reclaiming. W. C. State, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,717,710.* CHAFER-APPLYING MACHINE. This invention provides an improved applying device for chafer strip stock that will form and position the sidewall portions of the stock while the operator applies tension to the material as it is fed. A. R. Krause and H. C. Hutchens, assignors to Gillette Rubber Co., all of Eau Claire, Wis.

1,717,849.* INDICATING CALENDER ROLL TEMPERATURE. A device for holding in active relation to a calender roll the temperature responsive part of a temperature indicating or recording device. C. E. Maynard, Northampton, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,718,174.* VULCANIZER FOR SOLES. By this invention, means are devised whereby internal vulcanization of a boot or shoe is carried out rapidly and effectively and creasing of the upper is obviated. F. Nielsen, Epping, near Sydney, New South Wales, Australia.

1,718,631.* TIRE-VULCANIZING MOLD. This relates to vulcanizing pneumatic tires having unusually thick treads pierced with transversely molded holes. The apparatus is quick opening and automatic in action as to the withdrawal of the core pins from the tire. J. W. Brundage, assignor to Lambert Tire & Rubber Co., both of Akron, O.

*Pictured in group illustration.

1,718,660.* TIRE CONVEYER. This invention provides an improved conveyer for tire factories including one adapted to receive and spread apart the beads of a tire casing along one reach thereof and to conduct the tires along another reach where pressure bags are inserted and partially inflated for vulcanization. N. H. Myers, Akron, and O. E. Sords, Cuyahoga Falls, assignors to The Firestone Tire & Rubber Co., Akron, all in O.

1,718,793.* BUFFING AND CEMENTING MACHINE. This provides for abraiding or buffing the ends of inner tubes and applying cement in a wholly automatic manner so that the tubes are rapidly prepared with the assurance that each joint will be properly and effectively prepared. S. Malke, Milwaukee, Wis.

1,718,925.* INNER TUBE VULCANIZER. This is a watch-case type vulcanizer in which the mold is divided at its inner periphery at some distance above its inner circumference. The entire periphery of the mold about the vulcanizing cavity can be fully heated so as to cure the tube evenly about its entire cross section. C. B. Hudson, assignor to The Akron Standard Mold Co., both of Akron, O.

1,719,218.* SOLID TIRE VULCANIZER. The objects of this invention are economy of molding and vulcanizing equipment and the production of rubber articles having the desirable wear-resisting qualities which have been found to exist in those vulcanized in direct contact with water under high pressure. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,716,375. SHEET MATERIAL FEEDER. F. D. Fowler, Newton, assignor to Hood Rubber Co., Watertown, both in Mass.

1,716,378. LINK MAT ASSEMBLY. H. W. Hollenbeck, Kirkland, assignor to Durable Mat Co., Seattle, both in Wash.

1,716,552. BAND FORMING MACHINE. D. E. Hennessy, Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,716,578. BEAD SETTER. A. J. Dexter, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,716,585. TURN-UNDER STITCHING DEVICE. W. F. Irrgang, assignor to The Fisk Rubber Co., both of Chicopee Falls, Mass.

1,716,596. BAND-INVERTING DEVICE. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,716,696. PLASTIC STRAINING MACHINE. J. A. Himrod, assignor to Erie Foundry Co., both of Erie, Pa.

1,717,134. BEAD TURNING MACHINE. D. L. Williams, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

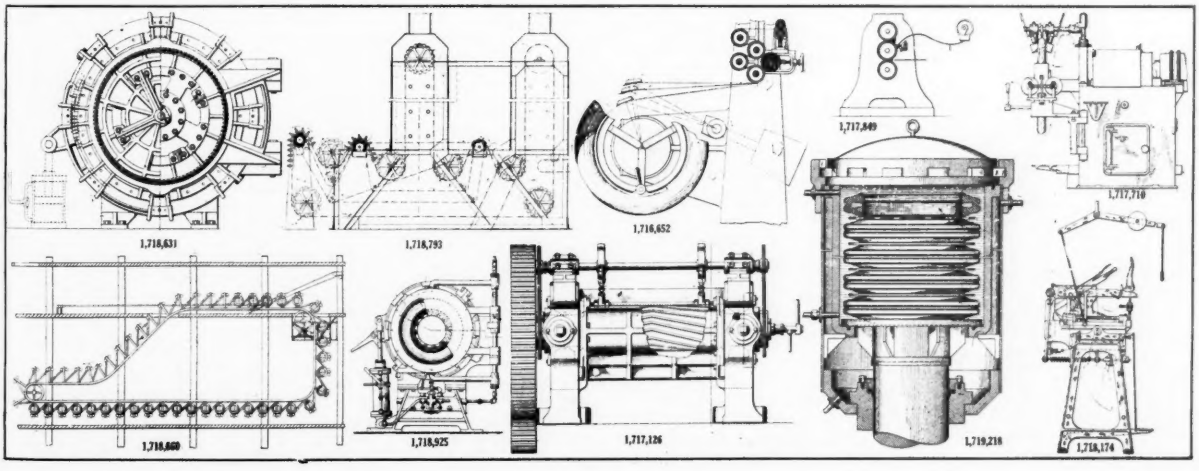
1,717,437. TIRE BUILDING CORE. B. De Mattia, Clifton, N. J., assignor, by mesne assignments, to National Rubber Machinery Co., Akron, O.

1,717,620. SAFETY PLUG. S. Page, Melrose, assignor to Hood Rubber Co., Watertown, both in Mass.

1,717,845. FABRIC GUIDE. W. F. Irrgang, assignor to The Fisk Rubber Co., both of Chicopee Falls, Mass.

1,718,485. REPAIR VULCANIZING DEVICE. H. J. O'Sullivan, assignor of one-half to H. J. Bensinger, both of Los Angeles, Calif.

1,718,633. STITCHING DEVICE. F. T. Cardarelli and A. La Barre, assignors to The Firestone Tire & Rubber Co., all of Akron, O.



Rubber Patents, Trade Marks and Designs

1,718,636. COLLAPSIBLE CORE. P. De Mattia, Passaic, N. J., assignor, by mesne assignments, to National Rubber Machinery Co., Akron, O.

1,718,959. TIRE SPREADING TOOL. K. P. Hubbard, Newark, N. J.

1,719,206. TUBE-SPLICING APPARATUS. H. L. Young, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,719,738. CORD FABRIC WINDER. H. N. Wayne, Santa Monica, Calif.

Dominion of Canada

290,173. FABRIC FEEDING DEVICE. The Goodyear Tire & Rubber Co., assignee of E. F. Maas, both of Akron, O., U. S. A.

290,351. GOLF BALL PAINTER. The Burke Golf Co., assignee of A. Turner, both of Newark, O., U. S. A.

290,733. VULCANIZING MACHINE. F. Nielsen, Sydney, N. S. W., Australia.

290,797. TIRE MAKING APPARATUS. The Dominion Rubber Co., Ltd., Montreal, Que., assignee of A. O. Abbot, Jr., Detroit, Mich., U. S. A.

290,843. TIRE REPAIR VULCANIZER. La Société des Procédés "Fit," Grenoble, Isère, assignee of E. Garabiol, Corenc, par la Tronche, Isère, both in France.

United Kingdom

308,706†. COATING FILAMENTS. M. Draemann, 27 Ardeiyerstrasse, Fröndenberg, Ruhr, Germany.

309,008. TIRE BUILDING MACHINE. India Rubber, Gutta Percha & Telegraph Works Co., Ltd., 106 Cannon St., and W. L. Avery, of India Rubber, Gutta Percha & Telegraph Works, Silvertown, both in London.

309,266. DRYING FACTICE. A. E. Young, 12 Hereford Rd., Wavertree, Liverpool, E. G. Wilson, 13 The Esplanade, Waterloo, and E. Wilson & Son, Ltd., Aintree Rd., Bootle, both near Liverpool.

309,302. VULCANIZING APPARATUS. J. A. Spencer-Smith, 138 Argyle Rd., Ealing, London.

309,311. WATCH-CASE VULCANIZER. E. Fetter, 823 North Lakewood Ave., Baltimore, Md., U. S. A.

309,479†. WIRE BEAD LOOM. American Chain Co., Inc., Bridgeport, Conn., assignee of R. C. Pierce, Niles, Mich., both in the U. S. A.

309,562†. GOLF BALL PAINTER. Burke Golf Co., assignee of A. Turner, both of Madison Heights, Newark, O., U. S. A.

309,821. BOOT MOLD. D. F. Wilhelmi, Doorwerth, near Arnhem, Holland.

309,882. CONVEYER. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, J. T. T. Randles, H. Willshaw, and H. Smith, Fort Dunlop, Birmingham.

310,071. INNER TUBE JOINT. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, H. W. Bird and H. Willshaw, Fort Dunlop, Birmingham.

†Not yet accepted.

Germany

478,590. DIPPING MACHINE. Ernst Rohlin, Lutherstrasse 15, Berlin, W. 62.

478,591. HARD RUBBER PRESS. Al. Brandt, Röntgenstrasse 10, Berlin-Charlottenburg.

Designs

1,074,287. HEATING CABINET. Firma Heinrich Schirm, Spinnereistrasse 14-16, Leipzig W. 33.

1,077,178. PORTABLE VULCANIZER. M. Szurau, Stuttgarter Platz 20, Berlin-Charlottenburg 5.

1,078,234. VULCANIZER PRESS. R. Wachsler, Vienna. Represented by E. Siebel, Ritterstrasse 36, Berlin S. 42.

1,078,236. HEATER FOR VULCANIZATION. R. Wachsler, Vienna. Represented by E. Siebel, Ritterstrasse 36, Berlin S. 42.

1,078,237. ALUMINUM MOLD. R. Wachsler, Vienna. Represented by E. Siebel, Ritterstrasse 36, Berlin S. 42.

Process

United States

1,716,608. TUBE MANUFACTURE. E. S. Whittier, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,716,654. PAPER-LIKE MATERIAL. K. L. Moses, Springfield, Mass.

1,717,168. SPONGE RUBBER ARTICLE. R. J. Noar, Pendleton, England.

1,717,215. ELASTIC LACE BRAID. O. E. Huber, Reading, assignor to The Narrow Fabric Co., West Reading, both in Pa.

1,717,583. HEEL MANUFACTURE. C. Roberts, Winchester, Mass., assignor, by mesne assignments, to United Shoe Machinery Corp., Paterson, N. J.

1,718,153. TRACK TORPEDO. H. W. Kelly, Woodbridge, N. J.

1,718,645. INNER TUBE AND MANDREL. R. L. Gillespie, Barberton, assignor to The Firestone Tire & Rubber Co., Akron, both in O.

1,718,646. INNER TUBE MANUFACTURE. R. L. Gillespie, Barberton, assignor to The Firestone Tire & Rubber Co., Akron, both in O.

1,719,101. CURING RUBBER TO LEATHER. L. B. Conant, Cambridge, Mass., assignor, by mesne assignments, to Standard Patent Process Corp., a corporation of Mass.

1,719,633. RUBBER ARTICLE MANUFACTURE. M. C. Teague, Jackson Heights, N. Y., assignor to The Naugatuck Chemical Co., Naugatuck, Conn.

Dominion of Canada

290,175. TIRE MANUFACTURE. The Goodyear Tire & Rubber Co., assignee of B. Darrow, both of Akron, O., U. S. A.

290,176. PNEUMATIC TIRE. The Goodyear Tire & Rubber Co., assignee of B. Darrow, both of Akron, O., U. S. A.

290,471. ELECTRODEPOSITION. The Anode Rubber Co., Ltd., London, England, assignee of P. Klein, Budapest, Hungary.

United Kingdom

308,626. INDIA RUBBER. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, W. H. Chapman, and F. H. Lane, Fort Dunlop, Birmingham.

308,703. MAT. H. W. Bell, 5232 42nd Ave., S. W., Seattle, Wash., U. S. A.

308,849. ELASTIC FABRIC. J. T. Rowland, 20 Cottage View, Portsmouth, and S. J. Wright, of M. Wright & Sons, Quorn Mills, near Loughborough.

309,319. UTILIZING WASTE RUBBER. L. B. Conant, Cambridge, Mass., U. S. A.

309,391. PROOFING FABRIC. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, and G. W. Trobridge, Fort Dunlop, Birmingham.

309,675. IMITATION DOE-SKIN. C. E. Simpson, 9 Chatham St., Manchester.

Chemical

United States

1,716,474. RUBBER COMPOSITION. H. A. Winkelmann, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,716,478. COATING COMPOSITION OF LATEX. A. Biddle, Trenton, N. J., assignor to United Products Corp. of America, a corporation of Del.

1,717,093. ANTIOXIDANT. A. M. Clifford, assignor to The Goodyear Tire & Rubber Co., both of Akron, O.

1,717,248. PROCESSING LATEX. U. Pestalozza, assignor to Societa Italiana Pirelli, both of Milan, Italy.

1,717,664. CAN SEAL COMPOSITION. B. S. Clark, Maywood, Ill., assignor to American Can Co., New York, N. Y.

Dominion of Canada

290,167. RESINOUS PRODUCT. The Dunlop Rubber Co., Ltd., London, N. W. I., assignee of E. A. Murphy and D. F. Twiss, Birmingham, all in England.

290,174. ANTIOXIDANT. The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

290,378. SYNTHETIC RUBBER. I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of E. Tschunker, Köhn-Mülheim, W. Bock, Köhn-Flittard, and H. Meis, Leverkusen, all in Germany.

290,577. PLASTICIZED VULCANIZED RUBBER. The Dominion Rubber Co., Ltd., Montreal, Que., assignee of T. V. Binmore, Long Island City, N. Y., U. S. A.

290,798. ANTI-SUN CRACKING PRODUCT. An organic sulphoxide. The Dominion Rubber Co., Ltd., Montreal, Que., assignee of S. M. Cadwell, Leonia, and L. Meuser, Bergenfield, both in N. J., U. S. A.

290,802. ANTIAGER. One to 20 parts by weight of meta toluylene diamine in 1,000 parts of rubber. E. I. du Pont de Nemours & Co., assignee of H. W. Elley, both of Wilmington, Del., U. S. A.

United Kingdom

308,755†. SYNTHETIC RUBBER. I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.

309,161†. ANTIAGER. Reaction products of sulphur and an amine. The Goodyear Tire & Rubber Co., assignees of A. M. Clifford, both of Akron, O., U. S. A.

309,167†. AQUEOUS DISPERSION OF FACTIS. K. D. P., Ltd., Finsbury House, Blomfield St., London.

309,168†. ATTACHING RUBBER. Rubber Latex Research Corp., assignees of W. B. Wescott, both of Boston, Mass., U. S. A.

309,245. COAGULATING LATEX. J. Y. Johnson, 47 Lincoln's Inn Fields, London, (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany).

309,421. GUTTA PERCHA COMPOSITION. A Carpmael, 24 Southampton Buildings, London, (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany).

309,441†. ABRADING COMPOSITIONS OF FACTIS. Artifex Chemische Fabrik Ges., 86 Kielerstrasse, Altona-Stellingen, Germany.

309,575†. MICROPOROUS RUBBER. K. D. P., Ltd., Finsbury House, Blomfield St., London, assignee of H. Beckmann, 26 Albertinenstrasse, Zehlendorf, Berlin, Germany.

309,630. ARTICLES FROM DISPERSIONS. Anode Rubber Co., Ltd., 110 Bishopsgate, London, (P. Klein, 90 Thokolyut, Budapest).

309,662. HEAT INSULATION. Henley's Tyre & Rubber Co., Ltd., 20 Christopher St., Finsbury Square, London, and J. Traxler, Waterfield, Warlingham, Surrey.

309,947†. RUBBER ELECTROLYSIS. Siemens & Halske A. G., Siemenstadt, Berlin, Germany.

†Not yet accepted.

Germany

477,890. CABLE INSULATION. Electrical Research Products, Inc., New York, N. Y., U. S. A. Represented by B. Kugelmann, Berlin S. W. 11.

General

United States

June 11, 1929*

1,716,368. HEEL. L. B. Conant, Cambridge, Mass., assignor, by mesne assignments, to Standard Patent Process Corp., a corporation of Mass.

1,716,435. GOLF BALL. G. L. Fotheringham, Long Branch, N. J., assignor to Revere Rubber Co., Chelsea, Mass.

1,716,497. SHOCK ABSORBER. J. A. McCaskell, Salt Lake City, Utah.

1,716,539. SYRINGE. L. B. De Spain, Caldwell, Idaho.

1,716,550. HEAD-PROTECTIVE DEVICE. H. R. Hart, Montclair, N. J.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Rubber Patents, Trade Marks and Designs

1,716,610. STORAGE BATTERY. H. D. Wilson and A. L. Hopkins, Indianapolis, Ind., assignors, by mesne assignments, to Prest-O-Lite Storage Battery Corp., a corporation of Ind.

1,716,648. TIRE REPAIR PATCH. C. Y. Malcomb, Akron, O.

1,716,816. ELASTIC FABRIC. L. B. Chisholm, assignor to American Mills Co., both of Waterbury, Conn.

1,716,843. ELASTIC FABRIC. G. F. Townsend, assignor of one-half to E. W. Jenkins, both of Philadelphia, Pa.

1,716,859. CUSHIONING WEAR PLATE. G. Q. Lewis, Wheaton, assignor to W. H. Miner, Inc., Chicago, both in Ill.

1,717,122. ARCH AND HEEL CUSHION. G. M. Schaff, Cleveland, O.

1,717,127. MINER'S BOOT. J. Toole, Kirkland Lake, Ont., Canada.

June 18, 1929*

1,717,428. FLUSH TANK VALVE. H. W. Weida, Plainfield, N. J., assignor to American Hard Rubber Co., New York, N. Y.

1,717,458. SYRINGE WATER BAG. A. R. Logan, E. Chelmsford, Mass.

1,717,548. RESILIENT WHEEL. F. Berg, Mannheim, Germany.

1,717,790. SLIDE-FASTENER OVERSHOE. L. H. L'Hollier and F. Wray, Akron, O., assignors to The B. F. Goodrich Co., New York, N. Y.

1,717,842. INFLATION HEAD. P. D. Graves, Lumberton, assignor of one-half to N. Johns, Hamlet, both in N. C.

1,717,885. CONDUCTOR MOUNTING. A. H. Leipert, New York, N. Y., assignor to The Rubber Shock Insulator Corp., Wilmington, Del.

1,717,932. POLICEMAN'S BILLY. H. Miller, Chicago, Ill.

1,718,060. BATHING CAP. T. W. Miller, assignor to The Faultless Rubber Co., both of Ashland, O.

June 25, 1929*

1,718,300. PRESSURE-APPLYING AIR PAD. O. Michalk, Freital, near Dresden, Germany.

1,718,309. BOWLING PIN. C. J. Sheldon, Elyria, assignor of twenty-five per cent to W. J. Fitzgibbon and of twenty-three per cent to G. L. Schwartz, Youngstown, all in O.

1,718,385. SCREEN. C. F. Sherwood, Mill Valley, Calif., assignor to Oliver-Sherwood Co., a corporation of Calif.

1,718,386. RUBBER-COVERED SCREEN. C. F. Sherwood, Detroit, Mich., assignor to Oliver-Sherwood Co., San Francisco, Calif.

1,718,415. INK TRANSFER DRUM. T. C. Gowans, Brooklyn, N. Y.

1,718,474. PISTON. J. W. McQuaid, Fillmore, Calif.

1,718,508. TOY BALLOON. L. C. White, Norwalk, O.

1,718,537. CORD SET. F. C. De Reamer, Bridgeport, Conn., assignor to General Electric Co., a corporation of N. Y.

1,718,637. BATHER'S AMUSEMENT DEVICE. N. De Pento, Calabasas, Calif.

1,718,658. EMERGENCY JACK DEVICE. K. Matsumoto, Los Angeles, Calif.

1,718,662. TIRE VALVE. E. G. Oakley, Southport, assignor to Bridgeport Brass Co., Bridgeport, both in Conn.

1,718,906. CUSHION HEEL SHOE. E. F. Hurley, Rockland, Mass.

July 2, 1929*

1,718,978. DUPLEX HOSE. H. W. Protzeller, assignor to O. F. Jordan Co., both of East Chicago, Ind.

1,719,315. VAGINAL DOUCHE. A. C. E. Strom, Detroit, Mich.

1,719,628. TIRE CASING. C. M. Sloman, assignor to Morgan & Wright, both of Detroit, Mich.

1,719,746. NONSKID TRACTION SHOE. E. A. Baker, Mansfield, O.

1,719,802. TREATING SKIN PRODUCTS. A. Ferretti, Milan, assignor to Società Invenzioni Brevetti Anonima-Torino, Turin, both in Italy.

Dominion of Canada

June 4, 1929

290,072. CYCLE SADDLE TOP. H. and J. Jelley, coinventors, both of Birmingham, England.

June 11, 1929

290,244. VEHICLE DISK. P. H. Bachrach, Oceanside, Calif., U. S. A.

290,440. GOLF CLUB. The Schavolite Golf Corp., New York, N. Y., assignee of F. H. Schavoir, Stamford, Conn., both in the U. S. A.

290,443. ELECTRIC CABLE. The Simplex Wire & Cable Co., Boston 9, assignee of G. J. Crowdes, Dorchester, both in Mass., U. S. A.

June 25, 1929

290,727. HEEL. J. J. Murphy, Cincinnati, O., U. S. A.

United Kingdom

May 23, 1929

308,698. PHONOGRAPHIC RECORDER. W. S. Purser, 11 Bourne Hill, Palmers Green, and H. E. Holman, 64A, The Chase, Clapham Common, both in London.

308,747. RUBBER IN ACOUSTIC APPARATUS. W. S. Purser, 11 Bourne Hill, Palmers Green, and H. E. Holman, 64A, The Chase, Clapham Common, both in London.

308,801†. LOUD-SPEAKER DIAPHRAGM. F. X. L. H. M. G. Bonnier, 231 Boulevard Pereire, Paris.

308,889. VEHICLE HOOD. Standard Motor Co., Ltd., and R. W. Maudslay, Standard Motor Works, Canley, Coventry.

308,801†. MILK BOTTLE HOLDER. E. H. Williams, 2 Darley Grove, Farnworth, Lancashire.

May 29, 1929

309,144†. TIRE VALVE DUST CAP. P. T. Webb, 47 Guthrie Ave., Geelong, Victoria, Australia.

309,214. LOUDSPEAKER. T. McClelland, 81 Malden Rd., New Malden, Surrey.

† Not yet accepted.

Rubber Patents, Trade Marks and Designs

309,327. SOLID TIRE. H. S. Howarth, 106 Henshaw St., Oldham.

June 6, 1929

309,371. TIRE BEAD. T. Gore, Brooklyn, N. Y., U. S. A., and R. J. Dack, Brook Mills, Cleckheaton, Yorkshire.

309,435. PAVING BLOCK. J. S. Cowper, 24 Queensberry Pl., South Kensington, London.

309,544†. ENDLESS BELT CONVEYOR. Etablissements J. Laroche-Lechat Soc. Anon. and L. Montigny, 16 Quai Ed. Pynaert, Ghent, Belgium.

309,679. PNEUMATIC TIRE. S. Vidal-Topete, Savoy Hotel, Lausanne, Switzerland.

309,746. ROLLER. W. S. Stansfield, High Trees, Wyke, and A. B. Henshilwood, 89 Upper Rushton Rd., Thornbury, both in Bradford.

309,770. RESPIRATOR. R. E. Lane and Chloride Electrical Storage Co., Ltd., Clifton Junction, near Manchester.

June 12, 1929

309,787. TANK. W. Althoff, Bockenem, Harz, Germany.

309,881. VEHICLE SPRING SUSPENSION. L. Turner & Co., Ltd., Deacon St., Leicester, G. M. Turner, The Cottage, Swithland, Loughborough, G. F. D. Tennant, 7 Moorgate, London, and G. A. Orme, Sutton Oaks, near Macclesfield (Representatives of A. Turner), L. Rowland, Deacon St., Leicester, Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, H. Willshaw, and H. Smith, Fort Dunlop, Birmingham.

309,907†. RUBBER TREE GRADING. P. J. S. Cramer, 26 Van Hoeylaan, The Hague.

309,931. VIBRATION DAMPER. F. W. Lanchester, Dyott End, Oxford Rd., Moseley, Birmingham.

309,943†. MOTORCYCLE. E. Seignol, 72 Avenue Marceau, Paris, France.

309,986†. CARD FILLET FOUNDATION. R. Kern, 16 Lagerhausstrasse, Aachen, Germany.

310,123. HOSE PIPE. F. Reddaway & Co., Ltd., and W. C. Gardiner, Cheltenham St., Pendleton, Manchester.

310,200. RAINCOAT. J. A. Asselin, Baie des Cedres, North Shore, Que., Canada.

310,234. WINDOW CLEANER. M. Häupel (née Grummüller), and J. Häupel, 94 Mariahilferstrasse, Vienna.

310,264. TIRE. C. A. and A. J. A. Laing, 13 James St., Portobello, Midlothian.

†Not yet accepted.

Germany

477,515. HARD RUBBER CONTAINERS. A. J. M. Bailleux and A. F. Hill, Paris. Represented by J. Appitz and F. Reinhold, Berlin S. W. 11.

477,547. FOOTWEAR MANUFACTURE. Drs. I. and L. Dorogi and Dr. Dorogi & Co., Gummifabrik, A.G., Budapest-Albertfalva. Represented by W. Fritze and Dr. E. Boas, Berlin S. W. 61.

478,356. ATOMIZER. R. Schultheiss, Kahla, Thuringia.

478,836. HEEL. Balloon Rubber Heel Corp., Boston, Mass., U. S. A. Represented by Dr. K. Michaelis, Berlin W. 50.

479,735. ACCUMULATOR PLATE PROTECTION. Gottfried Hagen, A.G., Cologne-Kalk.

Designs

1,074,255. FINGER COT. Haug & Buchert, Balingen, Wurtt.

1,074,424. CELLULAR TUBE. J. Sperr and J. Kreinhofner, Neuhaus b. Windisch-Eschenbach, Oberpf.

1,074,495. REENFORCED HEEL AND SOLE. F. Zeltmann, Bulowstrasse 3, Wiesbaden.

1,074,551. RUBBER-SOLED SHOE. D. Becker A.G., Leibbrandstrasse, Frankfurt A. Main.

1,074,721. SHOE LAST. H. Feustel, Naila, Bavaria.

1,074,751. INFLATABLE BODY. H. Lindemann, Konigstrasse 52, Wandsbek.

1,074,780. SEAMLESS DRIVING BELT. G. Benjak, Kiefernstrasse 19, Dresden-N.

1,074,891 and 1,074,901. HOSE. C. Vollrath & Sohn, Komm.-Ges., Bad Blankenburg, Thuringia.

1,074,958. RUBBERIZED ROPE. Heinrich Hacker, Naumburg a. d. Saale.

1,075,041. RUBBER-CORED CONTACT CUTTER. R. Heusinger, Lindwurmstrasse 93, Munich.

1,075,150. FINGER COT FOR ORAL HYGIENE. A. Holle, Karlstrasse 75, Dusseldorf.

1,075,277. ANESTHETIC MASK. Dr. R. Sommer, Greifswald.

1,075,322. HANGER. Al. Munch, Meissen.

1,075,332. RUBBER-BANDED PLACARD. A. Angermeier, Krautstrasse 26, Barmen.

1,074,339. SPORT HOSE. A. Benndorf, Pausa i. V.

1,075,415. SWIMMING GLOVE. J. Reitz, Wiesenthal, Wurtt.

1,075,750. BALLOON. Firma Martin Jacobson, Hamburgerstrasse 34, Berlin-Spandau.

1,075,856. COVER WITH RUBBER VALVE. E. O. Weller, Hackerstrasse 10, Heidenau bei Dresden.

1,075,958. DEMOUNTABLE TIRE PROTECTOR. Herm. Perrin, Berzdorf bei Koln.

1,076,307. COVER CONTAINER. F. E. Krauss, Schwarzberg i. S.

1,076,351. EWER. W. Kleemann, Aegidienmarkt 12, and O. Forster, Neustadtring 14, Braunschweig.

1,076,367. RING WITH MOISTENER. W. Teichmann, Trierer strasse 281, Aachen-Forst.

1,076,757. RUBBER FOR FOOTRESTS. Aug. Kupper, G.m.b.H., Solingen.

1,076,780. CONDUIT CONNECTION. P. Jordan, Gravelottestrasse 13, Berlin-Steglitz.

1,076,916. HEEL. O. Schlappig, Achenbachstrasse 133, Dusseldorf.

1,077,024. WALL COVERING. Thuringer Schlauchweberei und Gummiwerk, Waltershausen, Thuringia.

1,077,044. RUBBER FOOT. K. Beyda, Humboldtstrasse 5/1, Munich 9.

1,077,078. POROUS RUBBER MATTRESS. M. Fritz, Richardstrasse 96, Dusseldorf.

1,077,301. AXLE BEARING. Vogtlandische Maschinenfabrik, vorm. J. C. & H. Dietrich, A.G., Plauen i. V.

1,077,370. WRITING PAD. Liga Gummiwerke A.G., Frankfurt a. Main-Hausen.

1,077,393. SPONGE RUBBER BOAT FENDER. H. Klein, Wiesenstrasse 26, Hamburg 19.

1,077,398. ABDOMINAL BINDER. A. Leister & Co., Breitestrasse 9, Breslau 1.

1,077,686. PNEUMATIC TIRE. M. Brunk, Nostizstrasse 39, Leipzig.

1,077,713. MAT FOR BOTTLES, ETC. A. Goerke, Sybelstrasse 5, Berlin-Charlottenburg.

1,077,779. PANTIES. Krohner & Blankertz, G.m.b.H., Marzellenstrasse 35, Cologne.

1,077,871. CONTAINER FOR ACIDS. Dr. Heinr. Traun & Sohne, vormals Harburger Gummi-Kamm Compagnie, Hamburg 8.

1,077,952. PADS FOR FURNITURE LEGS. O. Mense, Vienna. Represented by B. Noldner, Ohlauerstrasse 16/17, Breslau.

1,077,967. FAN. Firma M. Steinberg, Koln-Braunsfeld.

1,078,267. SUCTION RING ON CHRONOMETER. F. Kratzner, Akademiestrasse 34, Hanau a. M.

1,078,357. PROTECTIVE RING FOR RECORDS. P. Liebmann, Eisenbahnstrasse 17, Leipzig O. 30.

1,078,484. JAR RING. H. Kohn, (née Schulz), Babe, Post Friedrichsdorf.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b) are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

June 11, 1929

Act of February 20, 1905

257,480. LYNX—golf balls. The India Rubber, Gutta Percha & Telegraph Works Co., Ltd., doing business as The Silvertown Co., London, England.

257,486. BIRDIE FOUR—leather shoes having soles and heels of leather or rubber. Endicott Johnson Corp., Endicott, N. Y.

257,491. WATERBOY—swimming or bathing devices comprising body-supporting floats. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.

257,495. GOODY—balls and certain other sporting goods and toys. H. Goodman & Sons, Inc., New York, N. Y.

257,564. Square containing the words: "FLYING CLOUD"—golf balls. Butler Motors, Inc., Chicago, Ill.

257,568. GATES GREENLAWN HOSE—rubber and garden hose. The Gates Rubber Co., Denver, Colo.

257,570. Circle with a blue border, containing the words: "GOODYEAR CORD"—tires, parts of such, inside tube protectors, etc. The Goodyear Tire & Rubber Co., Akron, O.

257,589. VELVOCAP—rubber cushion caps used as shock absorbers on stapling machines and the like. J. B. Crofoot Co., Arlington Heights, Ill.

Act of March 19, 1920

257,625. GASHSTULL—belting, pneumatic tires, and tubes. Gash-Stull Co., Chester, Pa.

June 18, 1929

Act of February 20, 1905

257,810. SOLAR—pneumatic vehicle tires. The B. F. Goodrich Co., New York, N. Y.

257,821. Pair of superposed ellipses, one vertical, the other horizontal, their common center containing the word: "FIT"—machines and apparatus for renovating or retreading and repairing pneumatic tires. Société des Procédés Fit, Grenoble, France.

257,854. Coat of arms consisting primarily of a shield, 4 birds, and a streamer containing the words: "MOVEO ET PROFICIO" and below, the word: "KNOX"—golf balls. Knox Hat Co., Inc., New York, N. Y.

257,874. Representation of a boy floating on the water by means of a swimming device, and the words: "SEA BUOY FLOATER"—swimming and bathing devices comprising body-supporting floats and life preservers. S. Green, doing business as Sea Buoy Floater Co., Coney Island, N. Y.

257,899. ORONITE—solvent for rubber, etc. Standard Oil Co. of Calif., Wilmington, Del., and San Francisco, Calif.

Act of March 19, 1920

257,926. BRAUN'S BRUSHES—brushes for rubber industries, etc. Wm. Braun, doing business as William Braun Co., Brooklyn, N. Y.

June 25, 1929

Act of February 20, 1905

257,941. STRAIGHT EIGHT — pneumatic tires. Century Rubber Works, Cicero, Ill.

258,089. GOODY—rubber bands, erasers, etc. H. Goodman & Sons, Inc., New York, N. Y.

258,110. KOTO—elastic preservative top coating to waterproof and preserve mohair, leather, imitation leather, and canvas automobile tops and side curtains. F. J. Seltmann, doing business as Koto Rubber Co., Jersey City, N. J.

July 2, 1929

Act of February 20, 1905

258,246. KNOX—golf balls. Knox Hat Co., Inc., New York, N. Y.

258,338. Shield containing the words: "MARTIN CORD TIRES—QUALITY"—tires and tubes therefor. Custom Built Tire Corp. of America, New York, N. Y.

258,368. Representation of a star — hoof pads. Dryden Rubber Co., Chicago, Ill.

Rubber Patents, Trade Marks and Designs

258,369. STAR—hoof pads. Dryden Rubber Co., Chicago, Ill.

258,370. DICTATOR—rubber heels and soles. The Holtite Mfg. Co., Baltimore, Md.

Dominion of Canada

June 4, 1929

46,367. Number: "150"—packing and packing material made wholly of, or from various combinations of asbestos, rubber, cotton, flax, copper, lead, iron, and babbitt. The Garlock Packing Co., Palmyra, N. Y., U. S. A.

46,368. Word: "LYNX"—golf and other playing balls. The India-Rubber Gutta Percha & Telegraph Works Co., Ltd., 106 Cannon St., London, E.C., England.

46,369. Word: "PARAMOUNT," together with a representation of the figures of three persons leaning forward—automobile top finish, and waterproof fabrics including articles made therefrom such as rug anchors, bath mats, kitchen pot holders, table pads, hospital sheeting, and automobile robes. J. C. Haartz Co., New Haven, Conn., U. S. A.

United Kingdom

May 29, 1929

497,321. RUBO—india rubber for use in making air-tight joints between doors and frames of cold-storage chambers, and for use as a cushioning medium in motor car bodies and the like. F. J. Gibbs and C. G. Middleton, trading in copartnership, 62 Platsville Road, Mossley Hill, Liverpool.

June 5, 1929

497,605. Figure "9" in the loop of which appears the representation of a cat's face, and the words: "CATALASTIC WITH NINE LIVES"—elastic sandallings, webs, and cords (india rubber) for sale in the United Kingdom and for export to and sale in markets other than the Straits Settlements, Federated Malay States, Malaya, Siam, and the Dutch East Indies. Tubbs, Lewis & Co., Ltd., 29-30 Noble St., London, E. C. 2.

502,209. WOLVERTEEN — goods manufactured from india rubber and gutta percha not included in other classes. James Halstead, Ltd., Crow Oak Works, off Radcliffe New Road, Whitefield, Manchester.

June 12, 1929

488,978. QUORNA—elastic cords, braids, and webbings, all made of india rubber. M. Wright & Sons, Ltd., Quorn Mills, Leicester Road, Quorn, near Loughborough, Leicestershire.

496,677. Square containing a representation of an abbot with a scroll in his right hand, and below the words: "ABBOTT BRAND"—rubber-proofed and oilskin garments. Abbott, Anderson & Abbott, 17 Fore St., London, E.C.2.

501,480. RAINBOW—rubber bands. Perry & Co., Ltd., 36 Lancaster St., Birmingham.

June 19, 1929

497,883. RUBBER FLOW—friction brakes and parts thereof, recoil checks, and shock absorbers, all for vehicles and all of india rubber and ordinary metal, the metal predominating. John Warren Watson Co., Philadelphia, Pa., U. S. A.

499,776. PARANITE — chemical substances included in Class 1, derived from carbolic acid, benzine, and nitric acid, for preventing mold and rust on sheet india rubber and spots on crepe rubber. C. H. Windschuegl, 1 Leadenhall St., London, E.C.3.

502,166. AIR-EAU—india rubber boot-tree for stretching, warming, and drying boots and shoes. W. A. Vaughan, 25 Colville Square, London, W.11.

502,268. SPAD—waterproof garments. The Northern Rubber Co., Ltd., Victoria Works, Victoria St., Retford, Nottinghamshire.

Designs

United States

78,811. OVERSHOE. Term 14 years. R. T. Griffiths, Akron, O.

78,882. INFLATED TOY ALLIGATOR. Term 7 years. C. C. Gault, Wooster, O.

78,913. RAINCOAT. Term 14 years. H. Martin, Chicago, Ill.

Dominion of Canada

8,353. AUTOMOBILE TIRES. Gregory Tire & Rubber, 1926, Ltd., Port Coquitlam, B. C.

8,355. FOOTWEAR. Dominion Rubber Co., Ltd., Montreal, P. Q.

8,376 and 8,377. RUBBER CARRIAGE TIRES AND VEHICLE TIRES. Dominion Rubber Co., Ltd., Montreal, P. Q.

Labels

United States

35,931. BUFFALO HUNTERS. Rubber-stamp sets for children. The Superior Type Co., Chicago, Ill.

35,932. SUPERIOR OFFICE PRINTING OUTFIT. Rubber-stamp sets for offices. The Superior Type Co., Chicago, Ill.

35,933. COUNTY FAIR. Rubber-stamp sets for children. The Superior Type Co., Chicago, Ill.

35,934. RACERS FOR AIR, LAND, AND SEA. Rubber-stamp sets for children. Superior Type Co., Chicago, Ill.

35,935. KIDDIES PRINTING OUTFIT. Rubber-stamp sets for children. The Superior Type Co., Chicago, Ill.

35,936. AMERICAN INDIANS. Rubber-stamp sets for children. The Superior Type Co., Chicago, Ill.

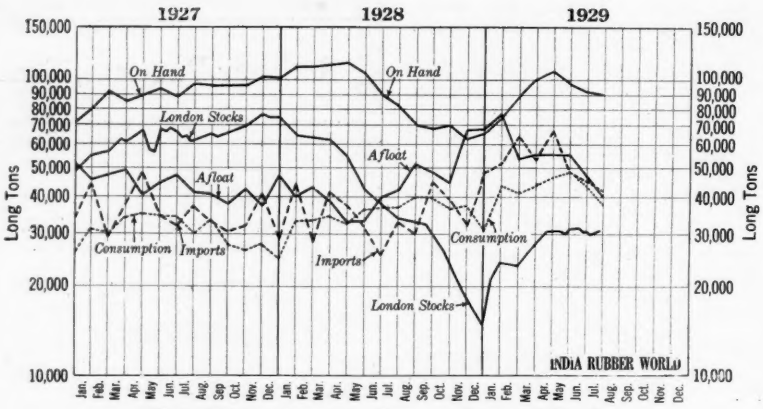
Imports, Consumption, and Stocks

The accompanying graph covers crude rubber importations, consumption, and stocks by months for the years 1927 to 1928, inclusive, and for January to July, inclusive, 1929. The figures for July are estimated.

The corrected imports for June totaled 44,490 tons or 2,490 tons over the estimated amount.

The corrected consumption for June was 43,228 tons or 228 more than estimated.

July estimated imports are placed at 42,000 tons. The other estimates for July are: consumption 38,000 tons, on hand 90,000 tons, and afloat 40,000 tons.



United States Imports, Consumption, and Stocks

London stocks from June 22 to July 20 inclusive kept between 30,000 and 31,000 tons which has been the condition since April. The record from June 22 to July 20 is as follows: June 22, 30,617 tons; June 29, 30,982 tons; July 6, 29,960 tons; July 13, 30,661 tons; July 20, 30,790 tons.

Liverpool stocks on the same dates were: June 22, 4,515 tons; June 29, 4,628 tons; July 6, 4,398 tons; July 13, 4,547 tons; July 20, 4,757 tons.

Twelve Months	Imports Tons	Consumption Tons	Stocks On Hand Tons	Stocks Afloat Tons	London Tons	Singapore and Penang Tons
1925	384,837	389,136	51,000*	48,000*	.....	.....
1926	411,900	366,140	72,510*	52,019*	.....	.....
1927	426,258	370,915	100,130*	47,939*	63,207*	25,868*
1928	448,378	441,336	66,166*	68,764*	24,423†	34,432*
1929						
January	52,305	43,000	76,342	78,596	24,423	33,119
February	64,528	41,594	90,058	53,825	25,000	.....
March	53,824	44,730	100,537	56,476	28,077	33,784
April	74,171	47,051	107,659	55,409	31,213	.....
May	49,180	48,746	97,192	55,404	31,893	.....
June	44,490	43,228	92,062	46,036	30,982	.....
July (est.)	42,000	38,000	90,000	40,000	.....	.....

*December 31. †January 26.
The 1928 figures, unless otherwise specified, are all as of the first of each month.

How to Treat Balloon Tires

In view of the great importance to vehicle owners of proper use of balloon tires, the Standards Division of the Society of Automotive Engineers has felt that the incorporation in the S.A.E. specifications of some information on load and inflation pressures for balloon tires for passenger cars and commercial vehicles and for high-pressure tires for commercial vehicles was advisable. As the Tire and Rim Association has approved such tables for publication in its handbook on specifications, the S.A.E. tire and rim division decided to recommend that the following table be adopted as a new S.A.E. recommended practice:

Passenger-Car Balloon-Tire Load and Inflation Table

Tire Size	Wheel Diam.	Minimum Inflation Pressure, lb. 28	30	32	34	36
		Maximum Load Per Tire in Pounds				
4.40	18 and 19	610	660	710	760	810
	20 and 21	650	700	750	800	850
4.50	18 and 19	650	700	750	800	850
	20 and 21	700	750	800	850	900
4.75	18 and 19	700	750	800	850	900
	20 and 21	745	800	855	910	965
5.00	18 and 19	745	800	855	910	965
	20 and 21	815	870	925	980	1035
5.25	18 and 19	815	870	925	980	1035
	20 and 21	880	940	1000	1060	1120
5.50	18 and 19	880	940	1000	1060	1120
	20 and 21	925	1000	1075	1150	1225
6.00	18 and 19	1000	1075	1150	1225	1300
	20 and 21	1075	1155	1240	1320	1400
(6.20) 6.50	18 and 19	1075	1155	1240	1320	1400
	20 and 21	1140	1230	1320	1410	1500
(6.75) 7.00	18 and 19	1200	1300	1400	1500	1600
	20 and 21	1300	1400	1500	1600	1700

Tire Production Statistics

United States tire manufacturers produced a total of 8,145,368 pneumatic casings during May, 1929. Total production of inner tubes is estimated at 7,660,172, and total production of solid and cushion tires at 52,815 for the month.

Total shipments during May are estimated as follows: pneumatic casings, all classes, 7,184,388; inner tubes, 7,037,590; solid and cushion tires, 56,552.

Inventories as of May 31, 1929, are estimated as 17,848,580 for all pneumatic casings; 18,927,646 for inner tubes; and 178,205 for solid and cushion tires.

The tire industry is estimated to have consumed a total of 88,037,370 pounds of crude rubber, and 31,069,490 pounds of cotton fabric during May, in the manufacture of all types of pneumatic casings, inner tubes, and solid and cushion tires.

The above statistics are Rubber Manufacturers Association figures raised to 100 per cent.

High Pressure Pneumatic Casings

	All Types Inventory	All Types Production	All Types Total Shipments	Cord Inventory	Cord Production	Cord Total Shipments
1928	.....	58,457,863	55,721,937	.....	19,302,218	19,351,380
1929						
January	10,284,158	5,041,530	4,969,647	3,651,041	1,563,554	1,461,104
February	11,620,960	5,183,693	3,961,751	4,073,644	1,373,691	974,185
March	12,263,816	5,639,426	5,031,101	4,330,747	1,397,657	1,157,188
April	12,696,808	5,912,854	5,470,779	4,292,167	1,305,224	1,335,121
May	13,386,440	6,109,026	5,388,291	4,285,674	1,371,987	1,356,529

	Balloon Casings Inventory	Balloon Casings Production	Balloon Casings Total Shipments	Solid and Cushion Tires Inventory	Solid and Cushion Tires Production	Solid and Cushion Tires Total Shipments
1928	.....	38,878,218	35,931,982	.....	508,223	512,602
1929						
January	6,583,958	3,470,596	3,499,121	149,240	31,583	33,051
February	7,472,592	3,796,660	2,976,698	145,811	29,747	31,463
March	7,858,642	4,229,586	3,863,650	141,902	35,441	40,205
April	8,346,727	4,601,986	4,123,769	137,613	38,419	43,130
May	9,047,376	4,732,416	4,022,910	133,654	39,611	42,414

	High Pressure Inner Tubes Inventory	High Pressure Inner Tubes Production	High Pressure Inner Tubes Total Shipments	Balloon Inner Tubes Inventory	Balloon Inner Tubes Production	Balloon Inner Tubes Total Shipments
1928	.....	23,255,891	23,749,966	.....	36,878,990	34,095,223
1929						
January	4,734,477	1,540,272	1,800,676	6,805,018	3,347,660	3,630,579
February	5,159,171	1,398,156	1,046,042	7,572,752	3,675,116	2,908,406
March	5,356,289	1,475,822	1,276,490	7,938,587	4,120,493	3,773,585
April	5,220,167	1,347,128	1,447,504	8,369,244	4,375,920	3,921,768
May	5,017,011	1,155,013	1,480,293	9,167,038	4,586,606	3,795,350

Cotton and Rubber Consumption
Casings, Tubes, Solid and Cushion Tires

	Cotton Fabric Pounds	Crude Rubber Pounds
1928	222,243,398	600,423,401
1929		
January	19,779,481	54,160,529
February	20,326,530	57,558,636
March	21,238,410	61,335,423
April	23,619,687	65,673,453
May	23,302,120	66,028,029

Rubber Manufacturers Association figures representing 75 per cent of the industry.

MARKET REVIEWS

CRUDE RUBBER

New York Exchange

JULY 1. With very little active trading and operators taking slight interest, rubber futures declined, selling being based principally on lower London cables of ⅛ pence, although at the close prices were unchanged. July, 20.50; Aug., 20.70; Sept., 21.00; Oct., 21.20; Nov., 21.40; Dec., 21.60; Jan., 21.90; Feb., 22.20; Mar., 22.40; Apr., 22.50; May, 22.60; June 22.70.

JULY 2. Strong buying by prominent Wall St. houses with foreign connections, together with acute short covering, developed a very strong market for all positions. Prices quickly advanced 50 to 60 points and closed on every position at the top. Outside interest seems to be increasing, especially as there is no let up in consumption. Eastern offerings are light and holders seem reluctant to sell even with the advance. Some selling was met on the advance, but all offers were taken. July, 21.00; Aug., 21.30; Sept., 21.60; Oct., 21.80; Nov., 22.00; Dec., 22.20; Jan., 22.40; Feb., 22.20; Mar., 22.80; Apr., 23.00; May, 3.10; June, 23.20.

JULY 3. Few traders cared to take active part or a position in view of the holiday, resulting in a narrow market, although there was some selling by Wall St. houses. CIF offers were high and unworkable and as there was no factory buying, dealers preferred to wait over the holiday. A little switching was done and the final prices were about 20 points lower all around. July, 20.80; Aug., 21.30; Sept., 21.40; Oct., 21.60; Nov., 21.90; Dec., 22.10; Jan., 22.30; Feb., 22.50; Mar., 22.70; Apr., 22.90; May 23.10; June, 23.10.

JULY 5. Buying orders accumulated over the holiday. Firm foreign markets and an estimated decline of over 1,000 tons in London stocks caused a general buying movement by traders and commission houses. Outside buying appeared on the advance which quickly absorbed what profit-taking there was and prices advanced ½-cent in all positions. However, at the close there was further profit-taking, and prices closed 20 points off from the highs. July, 21.10; Aug., 21.20; Sept., 21.80; Oct., 21.80; Nov., 21.90; Dec., 22.10; Jan., 22.60; Feb., 22.80; Mar., 23.00; Apr., 23.10; May, 23.30; June, 23.40.

JULY 6. For Saturday the trading was active and future prices advanced 40 to 60 points. This was caused by higher cables from London of advances in Singapore of almost ¼ pence. Some profit-taking was met, but a second buying wave caused prices to close at the highs of the day. July, 21.50; Aug., 21.80; Sept., 22.10; Oct., 22.40; Nov., 22.70; Dec., 22.60; Jan., 23.00; Feb., 23.30; Mar. 23.50; Apr., 23.70; May, 23.90; June, 24.20.

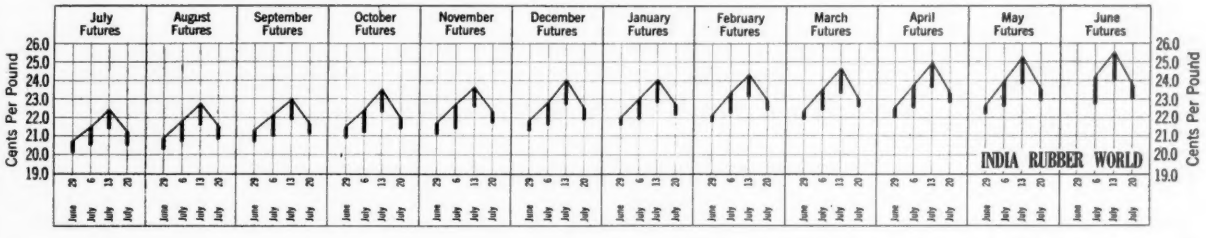
JULY 8. London opened up ¼ pence higher than Saturday's close with prices on all positions 40 to 50 points higher, The market was quiet for a short time, but active buying and short covering caused prices to advance with bids being made for 200 lots at top prices. Although excited trading and short selling was encountered on this advance, it was well absorbed and prices closed at the top with advances of from 100 to 110 points for some positions. London advanced another 1/16 pence before the close. July, 22.50; Aug., 22.80; Sept., 23.10; Oct., 23.40; Nov., 23.70; Dec., 24.00; Jan., 24.10; Feb., 24.20; Mar., 24.60; Apr., 24.80; May, 25.20; June, 25.40.

JULY 9. With lower London cables the market turned about, and with active selling by bears and those eager to cash in profits, prices quickly sold off 70 to 80 points and in some positions 100 to 110 points. The previous advance had been too rapid especially as factories were not following it up with purchases of actuals. Closing prices were on the lows. July, 21.70; Aug., 22.00; Sept., 22.30; Oct., 22.80; Nov., 23.00; Dec., 23.20; Jan., 23.40; Feb., 23.50; Mar., 23.60; Apr., 23.90; May, 25.20; June, 25.40.

JULY 10. Prices continued downward at the opening, but supported by foreign buyers and trade interests, the market steadied and advanced from the lows. As the result of continued buying by Wall St. houses and some short covering, prices closed 10 to 20 points up from the previous. July, 21.70; Aug., 22.10; Sept., 22.50; Oct., 22.90; Nov., 23.10; Dec. 23.40; Jan., 23.50; Feb., 23.70; Mar., 23.90; Apr., 24.10; May, 24.30; June, 24.50.

JULY 11. Prices opened steady about 10

New York Rubber Exchange—High and Low Monthly Futures—Weekly Changes on "A" Contracts.



The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLOSING PRICES—CENTS PER POUND—"A" CONTRACTS

Positions 1929	June, 1929 26	27	28	29	1	2	3	4*	5	6	8	9	10	11	12	13	July, 1929 15	16	17	18	19	20	22	23	24	25
July	20.3	20.7	20.5	20.3	20.5	21.0	20.8	....	21.1	21.5	22.4	21.7	21.7	21.6	21.4	21.6	21.2	20.7	20.7	20.7	20.5	20.5	20.8	20.7	20.6	20.7
August	20.5	20.9	20.7	20.6	20.7	21.3	21.1	....	21.3	21.8	22.7	22.0	22.1	22.0	21.6	21.8	21.5	21.1	21.0	21.0	20.8	20.8	21.1	20.9	20.7	20.8
September	21.0	21.3	21.1	21.0	21.0	21.6	21.4	....	21.6	22.1	23.0	22.3	22.5	22.4	21.9	22.1	21.7	21.3	21.2	21.4	21.1	21.2	21.4	21.4	21.3	21.4
October	21.1	21.5	21.2	21.2	21.2	21.8	21.6	....	21.8	22.4	23.5	22.8	22.9	22.7	22.3	22.5	22.0	21.5	21.6	21.6	21.4	21.5	21.7	21.6	21.4	21.6
November	21.3	21.7	21.4	21.4	21.4	22.0	21.9	....	22.1	22.7	23.6	23.0	23.1	23.0	22.6	22.8	22.3	21.8	21.8	21.9	21.7	21.7	22.0	22.0	21.8	22.1
December	21.5	21.8	21.6	21.6	21.6	22.2	22.1	....	22.3	22.8	24.0	23.2	23.3	23.3	22.7	23.0	22.5	22.1	22.0	22.2	21.9	21.9	22.4	22.4	22.1	22.4
1930																										
January	21.8	22.0	21.9	21.8	21.9	22.4	22.3	....	22.6	23.0	24.0	23.4	23.5	23.3	22.8	23.1	22.7	22.2	22.1	22.4	22.1	22.1	22.6	22.5	22.4	22.6
February	22.0	22.1	22.1	22.1	22.2	22.6	22.5	....	22.8	23.3	24.3	23.5	23.7	23.6	23.1	23.3	22.9	22.5	22.4	22.6	22.4	22.4	22.8	22.7	22.6	22.8
March	22.2	22.3	22.3	22.3	22.4	22.8	22.7	....	22.9	23.3	24.6	23.6	23.9	23.8	23.3	23.5	23.0	22.7	22.7	22.8	22.6	22.6	23.0	22.9	22.9	23.0
April	22.3	22.5	22.4	22.5	22.5	23.0	22.9	....	23.1	23.7	24.9	23.9	24.1	24.0	23.6	23.8	23.3	22.9	22.9	23.0	22.8	22.8	23.3	23.0	23.0	23.2
May	22.5	22.6	22.6	22.6	22.6	23.1	23.0	....	23.3	23.9	25.2	24.1	24.3	24.2	23.8	24.1	23.5	23.0	23.0	23.2	22.9	23.0	23.5	23.1	23.1	23.3
June	....	....	....	....	22.7	23.2	23.1	....	23.4	24.2	25.4	24.2	24.5	24.4	24.0	24.3	23.7	23.2	23.2	23.4	23.0	23.2	23.7	23.5	23.3	23.6

*Holiday.

points up from previous close. The market was very dull all day and with no definite trend, prices fluctuating within a 10- to 20-point range. Although the market was steady, no one seemed inclined to take a position, but there was impressive absorption by large rubber trade factors who took up fair weights of July rubber. London ruled well above New York parity and the East remained strong. July, 21.60; Aug., 22.00; Sept., 22.40; Oct., 22.70; Nov., 23.00; Dec., 23.30; Jan., 23.30; Feb., 23.60; Mar., 23.80; Apr., 24.00; May, 24.20; June, 24.40.

JULY 12. With easier London cables all positions opened lower by about 40 to 50 points. After this initial selling and consideration of Rubber Association figures which showed a reduction in stocks of 15,000 tons, the largest for any one month prices steadied and came back 20 to 30 points, only to meet rather aggressive selling with prices closing 40 to 50 points off for the day. July, 21.40; Aug., 21.60; Sept., 21.90; Oct., 22.40; Nov., 22.60; Dec., 22.70; Jan., 22.80; Feb., 23.10; Mar., 23.30; Apr., 23.80; May, 23.80; June 24.00.

JULY 13. Saturday trading was active, Singapore cables firmer, and with short covering over the week-end, prices stiffened and closed about 20 points higher all around. July, 21.60; Aug., 21.80; Sept., 22.10; Oct., 22.50; Nov., 22.80; Dec., 23.00; Jan., 23.10; Feb., 23.30; Mar., 23.50; Apr., 23.80; May, 24.10; June 24.30.

JULY 15. With London ⅛ pence over Saturday's market and then easing off to 1/16 pence below the close of Saturday, exchange prices sagged. However, on increased selling toward the close there was further recession so that prices were 30 and in some positions 50 points lower. There was no outside interest, the session being an extremely dull one. July, 21.20; Aug., 21.50; Sept., 21.70; Oct., 22.00; Nov., 22.30; Dec., 22.50; Jan., 22.70; Feb., 22.90; Mar., 23.00; Apr., 23.30; May, 23.50; June, 23.70.

JULY 16. There was much bearish sentiment due to low London cables and also to the reported slowing up of factory production and the liquidation of Wall Street operators. Prices declined about 50 points, but short selling and some real buying at the close stiffened them about 10 points. July, 20.80; Aug., 21.10; Sept., 21.30; Oct., 21.50; Nov., 21.80; Dec., 22.10; Jan., 22.20; Feb., 22.50; Mar., 22.70; Apr., 22.90; May, 23.00; June, 23.20.

JULY 17. London was down 1/16 pence for spot, but the other positions were the same as the last close. Prices were at the highs at the opening, but with extremely dull trading and no outside interest. Prices fluctuated in a range of about 10 points with no definite trend either way. July, 20.70; Aug., 21.00; Sept., 21.20; Oct., 21.60; Nov., 21.80; Dec., 22.00; Jan., 22.10; Feb., 22.40; Mar., 22.70; Apr., 22.90; May, 23.00; June, 23.20.

JULY 18. With London 1/16 to ⅛ pence better, a firmer tone was in evidence at the opening. Trading, however, was dull all day, and prices fluctuated in narrow ranges with no definite trend. There was enough buying power to the gains made at the opening of from 10 to 20 points in several positions. July, 20.70; Aug., 21.00; Sept., 21.40; Oct., 21.60; Nov., 21.90; Dec., 22.20; Jan., 22.40; Feb., 22.60; Mar., 22.80; Apr., 23.00; May, 23.20; June, 23.40.

JULY 19. Since London was higher, local traders were on the buying side with plenty of offers. Because some factories were asking for delayed deliveries of actuals, prices slid off 20 to 30 points with good support from the trade and Wall Street houses, but closed on the lows. July, 20.50; Aug., 20.80; Sept., 21.10; Oct., 21.40; Nov., 21.70; Dec., 22.00; Jan., 22.10; Feb., 22.40; Mar., 22.60; Apr., 22.80; May, 22.90; June, 23.00.

JULY 20. Rubber futures closed steady with very little trading. London was steady up 1/16 pence for spot, but off 1/16 pence on the futures. July, 20.50; Aug., 20.80; Sept., 21.20; Oct., 21.50; Nov., 21.70; Dec., 21.90; Jan., 22.10; Feb., 22.10; Mar., 22.60; Apr., 22.80; May, 23.00; June, 23.20.

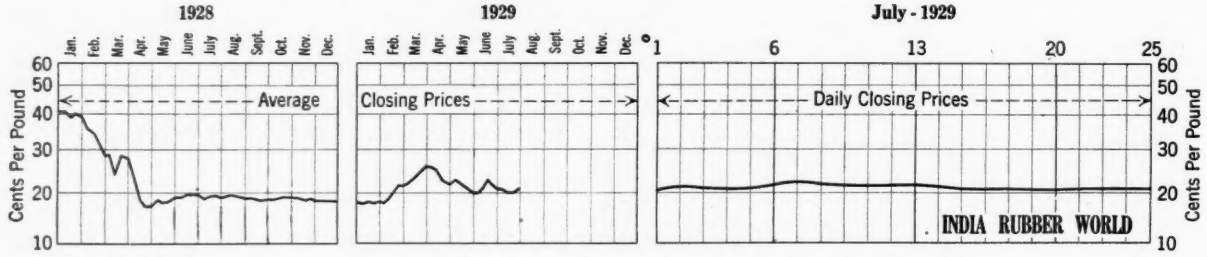
JULY 22. London was strong and all positions opened higher with good buying and short covering. CIF offers of Saturday were withdrawn. This helped to strengthen the market. Traders were on both sides of the market, and prices closed firm. July, 20.80; Aug., 21.10; Sept., 21.40; Oct., 21.70; Nov., 22.00; Dec., 22.40; Jan., 22.60; Feb., 22.80; Mar., 23.00; Apr., 23.20; May, 23.50; June, 23.70.

JULY 23. London was firm, and opening prices continued to advance. But as factories would not follow the advance with purchases of actuals, offers were more plentiful, resulting in losses of 20 to 30 points from the day's highs, closing practically at yesterday's close. July, 20.80; Aug., 20.90; Sept., 21.40; Oct., 21.60; Nov., 22.00; Dec., 22.40; Jan., 22.50; Feb. 22.70; Mar., 22.90; Apr., 23.00; May, 23.10; June, 23.50.

JULY 24. A very dull day on the Exchange. London fluctuated in a range of 1/16 to ⅛ pence, while local prices did not fluctuate at all, or in a 10-point range. Traders sat by with just enough trading to make prices. July, 20.70; Aug., 20.90; Sept., 21.30; Oct., 21.50; Nov., 22.00; Dec., 22.20; Jan., 22.40; Feb., 23.70; Mar., 22.90; Apr., 23.00; May, 23.10; June, 23.30.

JULY 25. Slight declines on London opening and a recovery before New York opening made a cautious market, and prices backed and filled with trading very limited. As the day advanced, prices met resistance and with a little short covering, prices stiffened up with gains of 20 to 30 points for some positions. The market closed practically on the highs. July, 20.80; Aug., 20.90; Sept., 21.50; Oct., 21.70; Nov., 22.10; Dec., 22.40; Jan., 22.60; Feb., 22.80; Mar., 23.00; Apr., 23.20; May, 23.40; June, 23.50.

New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets



New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

PLANTATIONS	June, 1929 24	25	26	27	28	29	July, 1929 1	2	3	4*	5	6	8	9	10	11	12	13	15	16	17	18	19	20
Sheet																								
Ribbed smoked	20⅜	20¼	20½	20¾	20½	20½	20⅝	21¼	21	....	21¼	21⅝	22½	22	22	21⅞	21⅝	21¾	21⅜	20⅞	20⅞	21	20¾	20¾
Crepe																								
First latex	21⅝	21½	21⅝	21¾	21⅝	21½	21¾	22¼	22	....	22¼	22⅝	23⅛	22⅞	22⅞	23	23	22⅞	22⅝	22⅛	22⅛	22¼	22⅛	22⅛
"B" blanket	18⅝	18½	18⅝	19	18⅝	18⅝	18¾	19⅛	18⅞	....	19⅛	19⅜	20⅜	19⅞	19⅝	19⅝	19½	19⅝	19⅛	18¾	18⅝	18¾	18½	18½
"C" blanket	18⅜	18¼	18⅜	18⅝	18⅜	18⅜	18⅜	18⅞	18⅝	....	18⅞	19⅛	20	19⅝	19⅜	19⅜	19¼	19⅜	19	18½	18¼	18½	18¼	18⅛
"D" blanket	17¾	17¾	17⅞	18⅛	17⅞	17¾	18⅛	18½	18¼	....	18½	18¾	19½	19⅛	18⅞	18⅞	18¾	18¾	18½	18⅛	17¾	18	17¾	17¾
No. 2 brown	18¼	18¼	18⅜	18⅝	18⅜	18⅜	18¾	18⅞	18⅝	....	18⅞	19⅛	20	19⅝	19⅜	19⅝	19½	19⅝	19⅜	18⅝	18½	18½	18⅜	18¼
Rolled brown	13½	13⅜	13½	13¾	13⅝	13⅝	13⅞	13¾	13⅝	....	13⅞	14¼	14¾	14¼	14⅛	14¼	13¾	14⅛	13⅞	13½	13¼	13⅝	13½	13¼
Off latex	21⅛	21⅛	21¼	21½	21¼	21⅛	21½	21½	21½	....	21¾	22	22⅝	22⅜	22⅜	22½	22⅜	22⅜	21¾	21¼	21½	21¾	21⅜	21⅜

*Holiday.

The month closed to date with underlying strength and very few traders taking a short position except for quick trading profits.

New York Outside Market

JULY 1. With a fair demand for spot and nearby rubber, prices were very steady and standard ribs were obtained in fair quantities, but first latex crepe appeared scarcer, dealers asking ¼-cent higher than the previous day. Large factories were after weight and the smaller ones, although nibbling, took light weights. The market closed steady with no excitement.

Spot	Today	Month Ago	Year Ago
Crepe	22	22	19⅛
Ribs	20¾	21⅝	18⅞
Upriver Fine	21¾	23	22

JULY 2. Higher London cables and the knowledge that yesterday a large manufacturer took most of the surplus rubber out of the spot and nearby market caused uneasiness among the shorts. With active factory buying, especially in New England, prices advanced all along the line for every grade and position. Dealers picking up C I F offers found the market rather bare of actual rubber and prices ½-cent higher all around. The market closed active.

Spot	Today	Month Ago	Year Ago
Crepe	22½	22	19¼
Ribs	21⅜	21⅜	18⅞
Upriver Fine	22	23	22

JULY 3. There was little incentive on the part of factory buyers or dealers to take an active part in the market. Rubber invoice figures were rather satisfactory as the export figures for the week ended June 29 were the smallest in many weeks. London was quiet and steady, with the C I F offers small and above a workable figure. With the approaching holiday, prices eased off about ⅛- to ¼-cent.

Spot	Today	Month Ago	Year Ago
Crepe	22¼	22	19⅛
Ribs	21	21⅜	18⅞
Upriver Fine	22	23	22

JULY 5. Accumulated buying orders over the holiday and a strong foreign market caused prices to advance again. All grades and positions were up ⅜-cent. Crepe retained its premium over ribs and was rather scarce. Good buying by factories and a strong Continental demand helped to strengthen the market. Shipment offers were strongly held, although dealers picked up all offers which they could work at a profit. Prices eased a little at the close.

Spot	Today	Month Ago	Year Ago
Crepe	22⅜	22	19⅛
Ribs	21¼	21¼	19
Upriver Fine	21¾	22½	22

JULY 8. The market opened very strong on the Exchange, which made holders of shipment offers reluctant to sell. This, together with a reduction of about 1,000 tons in London stocks, helped a rising market and advances of 1 to 1¼ cents were seen on all grades. Some factory buying appeared, but as a rule they held off as the advance was too rapid. However, prices held at the close and dealers were reserved.

Spot	Today	Month Ago	Year Ago
Crepe	23⅜	22	19¼
Ribs	22½	21⅝	19¼
Upriver Fine	22¾	22½	22

JULY 9. A reactionary trend in London started a downward movement especially as factories had not followed the advance. Heavy profit-taking with good short selling caused a sharp decline of ¾-cent per pound. Some factories picked up a little rubber on this break while others preferred to wait for further recessions. Final prices were off ½- to ⅝-cent from the previous day's high.

Spot	Today	Month Ago	Year Ago
Crepe	23⅛	22	19¼
Ribs	21⅞	21⅜	19¼
Upriver Fine	22½	22½	22

JULY 10. With easier cables and factories still reluctant to pay high prices, the market declined, but there was enough dealer buying-power together with steady shipment offers and no bargains to cause a steady market resulting in about an ⅛-cent advance. The market was quiet, buyers waiting for the next trend.

Spot	Today	Month Ago	Year Ago
Crepe	23½	21½	19½
Ribs	22	20⅝	19¼
Upriver Fine	22½	22¼	22

JULY 11. Actual rubber prices ruled steady with a fair interest for nearby and Aug. positions, but factories were not inclined to buy futures. Some buyers are reported to have delayed too long and these will have to buy regardless of price when they enter the market, especially as the East remains firm and foreign offers light.

Spot	Today	Month Ago	Year Ago
Crepe	23½	21½	19½
Ribs	22	20⅝	19¼
Upriver Fine	22½	22½	22

New York Quotations

Following are the New York outside market rubber quotations for one year ago, one month ago, and July 25, the current date

Plantation Hevea	July 25, 1928	June 25, 1929	July 25, 1929
Rubber latex (Hevea)...gal.	$1.40 @	$1.50 @	$1.50 @
CREPE			
First latex, spot	.20 @.20¼	.21½@.21¾	.22½@.22¾
August	.20 @.20⅜	.21¾@	.22¾@
August-September	.20 @	.21⅞@	.22¾@.23
October-December	.19⅞@	.22 @	.23 @.23¼
January-March	.19⅞@.20	.22¼@	@
Off latex, spot	.19⅝@	.21½@	.21¾@.22
"B" Blanket, spot	.19 @	.18½@	.18¾@.19
August	.19 @	.18½@	.18⅞@
August-September	.18⅞@	.18½@	.19 @.19¼
October-December	.18¾@	.18¾@	.19¼@.19¾
January-March	.18¾@	.19 @	.19½@.20
"C" Blanket, spot	.18¼@	.18½@	.18⅜@.18¾
Brown No. 1	.19 @.19¼	.18⅞@	.18½@.18¾
Brown No. 2	.18¾@.19	.18⅝@	.18¼@.18⅜
Brown, roll	.18¾@	.14 @	.14 @.14⅛
Sheet			
Ribbed, smoked spot	.19⅝@	.20¼@.20⅜	.21 @.21⅛
August	.19⅝@.19¾	.20¼@.20⅜	.21⅛@.21¼
August-September	.19⅝@	.20⅜@.20½	.21½@
October-December	.19½@	.21¼@.21⅜	.22¼@.22⅜
January-March	.19½@.19⅝	.21¾@	.22¾@.23
East Indian			
PONTIANAK			
Banjermasin	.09 @.09½	@	.10 @
Pressed block	.14 @.15	.16¼@	.17 @
Sarawak	.09 @.09½	@	.10 @
South American			
PARAS			
Upriver, fine	.22¾@	.21¾@	.22¼@
Upriver, fine	*.27 @	*.26½@	*.28¾@
Upriver, coarse	.15½@	.12½@	.12 @
Upriver, coarse	*.22½@	*.19 @	*.19 @
Islands, fine	.22 @	.20 @	.20½@
Islands, fine	*.26½@	*.26¼@	*.28 @
Acre, Bolivian, fine	.23½@	.22¾@	.23 @
Acre, Bolivian, fine	*.27½@	*.27 @	*.29½@
Beni, Bolivian	.23¾@	.23 @	.23½@
Madeira, fine	.22½@	.21¾@	.22¼@

South American	July 25, 1928	June 25, 1929	July 25, 1929
PARAS—*Continued*			
Peruvian, fine	$0.22@	$0.20 @	$0.21¾@
Tapajos, fine	.22 @	.20 @	.21½@
CAUCHO			
Upper caucho ball	.13½@	.12½@	.12 @
Upper caucho ball	*.22½@	*.19 @	*.19 @
Lower caucho ball	.13 @	.11¾@	.11 @
Maniçobas			
Ceará negro heads	@	†.20 @	†20 @
Ceará scrap	@	†.12 @	†.12 @
Manicoba, 50% guaranteed	@	†.22 @	†.22 @
Mangabiera, thin sheet	@	†.22 @	†.22 @
Centrals			
Central scrap	.14¼@.14¾	.11 @.12	.11 @.12
Central wet sheet	.10 @.12	.08 @.10	.08 @.10
Corintò scrap	.14¼@.14¾	.10 @.11	.11 @.12
Esmeralda sausage	.14¼@.14¾	.11 @.12	.11 @.12
Guayule			
Duro, washed and dried	.20 @	.19½@	.19½@
Ampar	.21 @	.21 @	.20½@
Gutta Percha			
Gutta Siak	.18 @.19	.20½@.21¾	.22 @
Gutta Soh	.25 @.27	@	.29 @
Red Macassar	2.00 @2.50	3.00 @	2.50 @
Balata			
Block, Ciudad Bolivar	.39 @.40	.52 @.53	.51 @.52
Colombia	.40 @.43	.46 @.48	.45 @.47
Manaos block	.40 @.42	.58½@.59½	.56 @.60
Panama	.38 @.40	@	.45 @.47
Surinam sheet	.46 @.48	.54 @.56	.54 @.55
Amber	.50 @.52	.57 @.59	.57 @.58
Chicle			
Honduras	‡.68 @	‡.68 @	‡.68 @
Yucatan, fine	‡.68 @	‡.68 @	‡.68 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

JULY 12. Rubber Association figures which showed consumption of 43,227 tons for June as compared to 49,233 for May were 5,551 tons more than June last year. To some this was bearish news as consumption had not kept up to the previous month. Yet the fact that stocks afloat to this country are 14,500 tons less than at the end of May puts a little different light on the subject. Prices for actuals eased at the opening in sympathy with exchange prices, but dealers were reluctant to sell until they had digested the figures a little more and especially as the factory buyers were more inclined to pick up any cheap offer, especially for nearby rubber. In fact this demand was rather good.

Spot	Today	Month Ago	Year Ago
Crepe	23¼	21¼	18¾
Ribs	21¾	20½	18⅝
Upriver Fine	22½	22¼	22

JULY 13. Very little was done in actual rubber. Dealers were reluctant sellers with Singapore up ⅛-pence and exchange prices up 30 to 40 points. The market held steady and rather firm.

Spot	Today	Month Ago	Year Ago
Crepe	23½	21¼	18¾
Ribs	22	20½	18⅝
Upriver Fine	22½	22¼	22

JULY 15. With recessions on the Exchange from 40 to 50 points and with importers on the selling side, rubber prices eased off. It was rumored that July consumption was slowing up, with some estimates of 6 to 8 per cent below June. However, there was some slowing down of Akron factories. This had a depressing influence. Factories were holding back.

Spot	Today	Month Ago	Year Ago
Crepe	22¾	20⅞	19½
Ribs	21½	20⅛	19⅜
Upriver Fine	22¼	21½	22

JULY 16. Rubber prices continued downward, sliding off about ½-cent on all grades and positions. The selling was attributed to lower London cables and more liberal offers from the Far East. The decline was also helped by lower prices on the Exchange and lack of real buying on the part of factories, who are looking for lower prices. A little buying was done but not enough to disturb the market.

Spot	Today	Month Ago	Year Ago
Crepe	22¼	20⅞	19⅝
Ribs	21	20⅛	19½
Upriver Fine	22¼	21½	22

JULY 17. The market was dull for actuals, but there was fairly good buying by western factories which was so well hidden that it did not disturb the market and allowed buyers to pick up a little needed rubber. The East and London were higher than this market, making dealers rather reserved in selling any quantity. In fact they were on the buying side picking up any cheap offer. There was fair buying of ambers with slightly lower premium on crepe.

Spot	Today	Month Ago	Year Ago
Crepe	21⅞	21	19¾
Ribs	21	20¼	19⅝
Upriver Fine	22¼	21½	22

JULY 18. With a fair demand for actuals by consumers and higher asking prices, factories withdrew. However, there was a fairly good underlying buying power at slightly lower prices, but the dealers would not meet these bids, and the market closed steady. Thin pale crepe still holds its premium of ¼ to ⅜-cent over standards. London stock increased slightly, but shipments to the United States fell off. CIF offers were above a workable basis, and very little business passed.

Spot	Today	Month Ago	Year Ago
Crepe	22¼	21⅜	19
Ribs	21	20⅝	18¾
Upriver Fine	22½	22¾	19

JULY 19. There was very little trading in actuals. Manufacturers continued to hold off; yet they had bids in the market and if dealers were willing to meet their prices, sales were made. However, with foreign markets firm, dealers were unwilling to meet the bid price. It was reported that large consumers bought in the Far East, which helped to make dealers reserved.

Spot	Today	Month Ago	Year Ago
Crepe	22	21⅜	19
Ribs	20⅞	20⅝	18¾
Upriver Fine	22¼	22¾	19

JULY 20. No business was reported on the half-day trading, and prices were steady and unchanged.

JULY 22. London stocks showed a gain of 129 tons and Liverpool a gain of 210 tons over the previous week. While this was not large, it showed that stocks are not decreasing and buyers are in no hurry to reach for their requirements. However, London cables were better, exchange prices up 30 to 40 points, and dealers reserved, advancing asking prices ⅜ to ½-cent all around. Factories continued to watch the market closely. Little actual business was reported.

Spot	Today	Month Ago	Year Ago
Crepe	22½	21¼	19⅞
Ribs	21⅛	20¼	19¾
Upriver Fine	22	22½	22

JULY 23. London cables were slightly firmer, and CIF offers very few and at impossible prices. Little business was reported; yet dealers were inclined to meet bids at the close on small lots.

Spot	Today	Month Ago	Year Ago
Crepe	22⅜	21¼	19⅞
Ribs	21⅛	20¼	19¾
Upriver Fine	22	22½	22

JULY 24. With the London market fluctuating up and down in a very narrow range there was little incentive for dealers and factories to trade in actuals. At the close the lack of factory buying and the reported reduction of 2½ to 5 per cent in tire prices by Goodyear to meet mail-order competition had a depressing effect, but dealers only took orders that suited their position.

Spot	Today	Month Ago	Year Ago
Crepe	22¼	21¼	19⅝
Ribs	20⅞	20⅜	19½
Upriver Fine	22	21¼	22½

JULY 25. Rubber prices came back quickly today because of firmer cables from London and few offers. Dealers were on the buying side whenever shipment offers were obtainable at fair prices and they also covered some of their requirements on the Exchange. Bids for spot rubber were made at 21 cents, showing need for nearby rubber. This, together with light arrivals so far, made a strong closing.

Spot	Today	Month Ago	Year Ago
Crepe	22½	21¼	19⅞
Ribs	21⅝	20⅜	19¾
Upriver Fine	22	22½	22¾

Singapore

An official cablegram dated July 17 from Singapore to the Malayan Information Agency of London, Eng., gives the following statistics regarding stocks of rubber on June 30, 1929. Dealers' stocks in Singapore, 24,930 tons; Penang, 5,473 tons; Malacca, 2,387 tons; Wellesley Province, 176 tons; Dindings, 74 tons; a total of 33,040 tons. Board stocks in Singapore, 711 tons; Penang, 747; a total of 1,458 tons. Grand total of dealers' and board stocks of 34,498 tons.

Rubber Afloat to the United States

All figures in long tons.

Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	Total
June 29..	6,103	1,416	1,946	73	9,538
July 6..	6,123	358	1,909	86	8,476
July 13..	6,648	927	1,708	7	9,290
July 20..	5,107	839	1,313	56	7,315

Crude Rubber Consumption

Consumption of crude rubber during June totaled approximately 46,000 tons, according to estimates made by members of the Rubber Exchange, based on operating rates of tire manufacturers during the month. While this will represent a decline of over 3,000 tons from the high record established during May of 49,233 tons, it will be more than 8,000 tons in excess of the rubber consumed during June, 1928.

Consumption for the first half of the year will be approximately 272,080 tons, a new high record for the industry, which will compare with 211,573 tons consumed during the first half of last year.

Crude rubber consumption for the first half of 1929, compared with the same months of 1928 and 1927, follows:

	1927	1928	1929
January	31,518	34,403	43,002
February	30,137	33,702	41,594
March	36,141	35,688	44,730
April	35,871	32,772	47,521
May	34,592	37,333	49,233
June	33,801	37,675	*46,000
Totals	202,060	211,573	272,080

*Estimated.

Increased Trading on The New York Exchange

Trading in crude rubber futures on the Rubber Exchange of New York in the first six months of 1929 showed a gain of approximately 10 per cent over the corresponding period in 1928, a total of 334,852 tons being traded, as compared with 305,087 tons in the first half of 1928.

Prices during the first half of the current year showed a much narrower spread than in 1928, ranging from a low of 17.80 cents per pound to 28.20 cents, against a range of 16.50 cents to 42.90 cents in the comparable period last year.

"Trade interests, both here and abroad, have utilized the hedging facilities of the Rubber Exchange on a broader scale this year than in any previous year," President Henderson said, "and the outlook for the balance of 1929 indicates further gains in this direction. In addition, there has been a marked improvement in public interest in crude rubber futures."

Henderson's Report

Heavy production of tires has tended to lessen interest in crude rubber futures, and trading on the National Rubber Exchange during the past week showed an average daily volume of slightly over 1,000 tons, says the F. R. Henderson Corp., New York, N. Y., in its weekly summary. The market was easier, with the range of price fluctuations for the week 1.1 cent per pound.

"Announcement of a 10 per cent curtailment of tire production at Akron, together with a cut in tire prices by a large mail-order house and the publication of tire and tube statistics indicating record-breaking inventories, has had a decidedly depressing effect," the report says. "In addition to this, manufacturers have exhibited very little buying interest during the week.

"We cannot feel alarmed over the present tire inventory, considering the expected business for the year. The curtailment in production is to be expected as a seasonal adjustment, and we believe the market has thoroughly discounted such procedure on the part of consumers.

"We estimate the arrivals at all ports U. S. A. from July 1 to July 19, inclusive, to be about 19,000 tons."

Price Differentials and Limits of Allowance

The Adjustment Committee of The Rubber Exchange of New York, Inc., on July 15 fixed the price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries on the Rubber Exchange during August, 1929, as follows:

Against "A" Contracts: Off Quality First Latex Crepe at two-tenths of a cent (.2c.) per pound; Good F. A. Q. Ribbed Smoked Sheets at four-tenths of a cent (.4c.) per pound; Ordinary F. A. Q. Ribbed Smoked Sheets at eight-tenths of a cent (.8c.) per pound.

Against "BB" Contracts: "C" Blanket Crepe at one-quarter of a cent (¼c.) per pound; "D" Blanket Crepe at sixty-five one-hundredths of a cent (.65c.) per pound; No. 1 Brown Crepe at contract price; No. 2 Brown Crepe at one-quarter of a cent (¼c.) per pound.

The committee also fixed the following limits of allowance on the two lowest grades deliverable against the "BB" contract: "D" Blanket Crepe at one-half of a cent (½c.) per pound; No. 2 Brown Crepe at one-quarter of a cent (¼c.) per pound.

The Board of Governors approved the foregoing scales of price differentials and limits of allowance at a meeting duly held on July 16.

Reclaimed Rubber

ALL types of reclaim have been in active movement during the past month. The usual summer decline of consumption in a few lines of reclaim is compensated for by increase of demand in others. The existing sound basis of business in general is reflected in the excellent demand for rubber goods, the production of which in the second half of this year bids fair to exceed that of the corresponding period of last year.

All previous records for the consumption of reclaim were exceeded by a liberal margin in the 6 months ended June 30, 1929, notwithstanding the low average price of crude rubber. This is proof virtually of the fact that reclaim is recognized generally by rubber manufacturers as having characteristic technical value in rubber goods manufacture distinct from that of crude rubber.

The standard grades listed below remain unchanged in price from one month ago, except in the cases of black super reclaim, black auto tire, black selected tires, and No. 2 tube reclaim. Each of these is quoted down ¼-cent a pound from the prices named in June.

New York Quotations

July 26, 1929

High Tensile	Spec. Grav.	Price Per Pound
Super-reclaim, black	1.20	$0.12¼ @ $0.12¾
red	1.20	.12 @ .12½
Auto Tire		
Black	1.21	$0.07½ @ $0.07¾
Black selected tires	1.18	.08 @ .08¼
Dark gray	1.35	.10 @ .10¼
Light gray	1.38	.12 @ .12¼
White	1.40	.12½ @ .13
Shoe		
Unwashed	1.60	.07 @ .07¼
Washed	1.50	.09¼ @ .10
Tube		
No. 1	1.00	.13 @ .13½
No. 2	1.10	.10¼ @ .10½
Miscellaneous		
Red	1.35	.12¼ @ .12¾
Truck tire, heavy gravity	1.55	.07 @ .07¼
Truck tire, light gravity	1.40	.07¼ @ .07½
Mechanical blends	1.60	.07 @ .07½

Rubber Scrap

THE rubber scrap market was seasonally quiet in July. Reclaimers are busy; therefore consumption of scrap is proceeding at a good rate. The scrap trade outlook is good for late summer and early fall.

BOOTS AND SHOES. The market is quiet on this grade. Black boots and shoes are down ⅛-cent from July 1 quotation. Untrimmed arctics and tennis are unchanged.

HARD RUBBER. Price firm and unchanged. Trade dull.

MECHANICALS. Market generally dull. Air brake hose has declined from $27.50 to $23 per ton. All other grades unchanged.

TIRES. Demand has improved. The accumulations of scrap are disappointing; therefore standard grades have advanced 50 cents to $1 a ton. White tires with and without beads are dull and unchanged.

MIXED AUTO PEELINGS are more active and the price has advanced to $36 a ton, $3 up.

MIXED MOTOR TRUCK TIRES. These are in better demand at $22 a ton, $2 up from last month.

INNER TUBES. There is a scarcity of the floating grade on which the price is now 7¼ cents a pound, ¾-cent up.

Price changes in the 21 grades listed are 7 in number of which only 2 are advanced. The remaining 14 grades are seasonally dull and steady. Consumers' buying prices are detailed as follows:

CONSUMERS' BUYING PRICES

Carload Lots

July 26, 1929

Boots and Shoes	Prices
Boots and shoes, black....*lb.*	$0.01½ @ $0.01¾
Untrimmed arctics.....*lb.*	.00¾ @ .01
Tennis shoes and soles...*lb.*	.00¾ @
Hard Rubber	
No. 1 hard rubber.....*lb.*	$0.08 @ $0.08½
Mechanicals	
Mixed black scrap.....*lb.*	.00½ @ .00⅝
Hose, air brake.....*ton*	23.00 @ 25.00
regular soft .....*lb.*	.00⅝ @
No. 1 red.....*lb.*	.02 @ .02¼
No. 2 red .....*lb.*	.01 @ .01½
White druggists' sundries.*lb.*	.02 @ .02½
Mechanical .....*lb.*	.01½ @ .01¾
Tires	
Pneumatic Standard—	
Mixed auto tires with beads .....*ton*	24.50 @ 25.00
Beadless .....*ton*	32.50 @ 33.50
White auto tires with beads .....*ton*	40.00 @ 42.00
Beadless .....*ton*	48.00 @ 49.00
Mixed auto peeling.....*ton*	36.00 @ 36.50
Solid—	
Mixed motor truck, clean .....*ton*	22.00 @
Inner Tubes	
No. 1, floating.....*lb.*	0.07¼ @ 0.07½
No. 2, compounded.....*lb.*	.04¼ @ .04¾
Red .....*lb.*	.04¾ @ .05
Mixed tubes .....*lb.*	.04¼ @

United States Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	April, 1929		Four Months Ended April, 1929	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	124,823,205	$25,542,726	*511,183,505	*$93,575,818
Liquid latex	11,462	2,125	.....	.....
Balata	365,023	93,240	863,915	273,188
Jelutong or Pontianak	2,433,478	315,621	6,318,822	845,501
Gutta percha	2,566	1,171	404,434	85,067
Guayule	187,000	38,241	187,000	38,241
Siak, scrap and reclaimed	2,170,635	46,959	7,226,188	157,553
Totals	129,993,369	$26,040,083	526,183,864	$94,975,368
Chicle *dutiable*	1,477,763	$737,542	6,612,392	$3,298,949
MANUFACTURED—*Dutiable*				
Belting	1,262	$974	13,629	$7,074
Tires	583	4,253	680	7,964
Other manufactures of rubber	.....	170,025	.....	730,080
Totals	1,845	$175,252	14,309	$745,118

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	7,377,078	$1,624,237	31,651,728	$6,866,458
Balata	21,523	6,951	62,228	23,180
Gutta percha, rubber substitutes and scrap	22,450	2,159	44,923	6,204
Rubber manufactures	.....	13,151	.....	52,821
Totals	7,421,051	$1,646,498	31,758,879	$6,948,663

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
Reclaimed	3,449,933	$230,695	10,872,362	$745,316
Scrap and old	4,255,577	213,092	17,100,917	838,193
Rubberized automobile cloth, *sq. yd.*	209,250	116,173	959,390	494,563
Other rubberized piece goods and hospital sheeting, *sq. yd.*	233,829	100,221	697,428	306,561
Footwear				
Boots *pairs*	71,587	144,055	315,636	710,510
Shoes *pairs*	109,047	89,523	635,354	521,786
Canvas shoes with rubber soles *pairs*	653,334	435,404	2,438,861	1,579,989
Soles *doz. pairs*	10,722	30,025	53,196	147,857
Heels *doz. pairs*	124,464	92,529	573,359	413,826
Water bottles and fountain syringes *number*	22,648	12,661	117,340	80,407
Gloves *doz. pairs*	7,770	21,461	35,197	94,005
Other druggists' sundries	.....	29,573	.....	134,853
Balloons *gross*	60,644	63,757	252,435	255,089
Toys and balls	.....	17,344	.....	59,235
Bathing caps *doz.*	29,845	64,100	88,022	198,863
Bands	41,737	25,214	176,941	95,570
Erasers	49,313	34,362	192,376	126,217
Hard rubber goods				
Electrical goods	224,947	27,805	835,675	107,730
Other goods	.....	56,889	.....	153,296
Tires				
Casings, auto *number*	230,334	2,947,065	1,125,926	13,526,738
Truck and bus casings, 6 inches and over, *number*	27,562	783,836	108,745	2,834,315
Other automobile casings, *number*	202,772	2,163,229	1,017,181	10,692,423
Tubes, auto *number*	145,176	278,300	745,547	1,353,395
Other casings and tubes, *number*	67,651	258,102	115,461	359,786
Solid tires for automobiles and motor trucks, *number*	3,685	121,590	17,325	529,023
Others	160,094	26,288	602,736	107,346
Tire accessories	.....	141,857	.....	585,252
Rubber and friction tape	167,358	49,996	606,949	181,460
Belting	434,783	235,264	1,862,681	985,013
Hose	806,979	267,689	3,127,872	1,041,921
Packing	269,170	99,870	1,043,760	440,892
Thread	170,807	170,819	582,350	611,911
Other rubber manufactures	.....	239,195	.....	1,284,591
Totals	.....	$9,587,983	.....	$41,597,932

*Liquid latex included.

London Stocks, May, 1929

	Landed for May Tons	Delivered for May Tons	Stocked May 31		
			1929 Tons	1928 Tons	1927 Tons
LONDON					
Plantation	6,454	6,551	31,129	44,472	66,990
Other grades	5	.....	86	89	125
LIVERPOOL					
Plantation	971	1,023	4,538	2,254	2,930
Total tons, London and Liverpool	7,430	7,574	35,753	46,815	70,045

†Official returns from the recognized public warehouses.

United Kingdom Statistics

IMPORTS

	May, 1929		Five Months Ended May, 1929	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude Rubber				
From—				
Straits Settlements	10,932,600	£492,664	66,296,600	£2,915,482
Federated Malay States	4,744,100	217,861	29,098,800	1,300,382
British India	728,900	32,768	5,400,700	246,656
Ceylon and Dependencies	1,411,500	63,223	14,771,000	682,562
Other Dutch possessions in Indian Seas	1,138,300	50,786	10,484,200	486,762
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,620,800	117,540	11,099,700	499,596
Other countries in East Indies and Pacific not elsewhere specified	183,100	8,256	926,400	41,315
Brazil	543,200	24,964	3,317,800	148,552
South and Central America (except Brazil)	.....	.....	123,400	5,426
West Africa				
French West Africa	30,200	1,041	87,900	2,589
Gold Coast	47,200	2,361	201,000	9,229
Other parts of West Africa	31,600	1,197	926,000	39,033
East Africa, including Madagascar	32,000	1,350	383,200	16,955
Other countries	304,200	14,581	634,200	29,198
Totals	22,747,700	£1,028,592	143,750,900	£6,423,737
Gutta percha and balata	286,300	23,178	2,049,900	153,024
Waste and reclaimed rubber	1,074,500	15,266	4,721,500	54,462
Rubber substitutes	9,500	193	44,800	1,137
Totals	24,118,000	£1,067,229	150,567,100	£6,632,360
MANUFACTURED				
*††Tires and tubes				
Pneumatic				
Outer covers	.....	£46,856	.....	£236,169
Inner tubes	.....	10,737	.....	41,566
Solid tires	.....	7,544	.....	40,624
Boots and shoes *doz. pairs*	150,183	184,015	539,087	665,049
Other rubber manufactures	.....	162,049	.....	830,502
Totals	.....	£411,201	.....	£1,813,910

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	2,668,800	£22,633	14,103,100	£109,005
Rubber substitutes	108,200	2,102	357,700	7,340
Totals	2,777,000	£24,735	14,460,800	£116,345
MANUFACTURED				
‡Tires and tubes				
Pneumatic				
Outer covers	.....	£334,072	.....	£1,317,082
Inner tubes	.....	49,527	.....	210,486
Solid tires	.....	15,822	.....	64,558
Boots and shoes *doz. pairs*	33,823	45,679	134,171	208,019
Other rubber manufactures	.....	305,335	.....	1,228,192
Totals	.....	£750,435	.....	£3,028,337

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED				
Crude Rubber				
To—				
Russia	144,600	£5,475	2,198,300	£96,429
Sweden, Norway, and Denmark	102,000	5,402	936,000	43,251
Germany	2,250,500	104,751	15,524,600	689,989
Belgium	762,700	36,911	4,172,200	183,756
France	5,119,500	234,506	18,671,300	836,143
Spain	50,600	2,927	718,700	33,396
Italy	924,200	44,343	4,084,200	194,719
Other European countries	416,900	22,125	2,613,800	119,576
United States	1,297,200	56,295	5,222,500	217,951
Canada	2,200	96	2,900	131
Other countries	225,600	11,103	890,900	45,267
Totals	11,296,000	£523,934	55,035,400	£2,460,608
Gutta percha and balata	51,200	4,477	503,400	35,282
Waste and reclaimed rubber	2,600	84	133,000	2,086
Rubber substitutes	600	30	1,300	68
Totals	11,350,400	£528,525	55,673,100	£2,498,044
MANUFACTURED				
*‡Tires and tubes				
Pneumatic				
Outer covers	.....	£9,077	.....	£28,009
Inner tubes	.....	1,588	.....	4,739
Solid tires	.....	.....	.....	963
Boots and shoes *doz. pairs*	2,040	3,423	6,788	15,408
Other rubber manufactures	.....	6,839	.....	30,340
Totals	.....	£20,927	.....	£79,459

*After April 12, 1927, tires and tubes imported or exported with complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

†Motor cars, motorcycles, parts and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts and accessories were exempt from duty until Apr. 30, 1926, inclusive, and rubber tires and tubes until Apr. 11, 1927, inclusive.

‡Tires and tubes included prior to Apr. 12, 1927.

Compounding Ingredients

THE movement for compounding ingredients was not notably affected by the usual summer relaxation of consuming demand simply because such relaxation is not pronounced even in tire and tube output. Mechanical rubber goods production is very active and gaining in volume. The same is seasonally true in other lines such as footwear, weatherproofs, auto topping, and druggists' sundries.

ACCELERATORS. The tendency of manufacturers to adopt short low temperature cures, where such can be applied, stimulates the sale of so-called ultra and semi-ultra accelerators. Manufacturers are always interested in the problem of accelerated cures both from the standpoint of efficiency and quality of product.

ANTIOXIDANTS. The antiaging chemicals offered for compounders' use are specifics for definite effect in protecting rubber goods from deteriorating in storage or service against oxidation, sun cracking, and failure by flexing.

BENZOL. There is seasonal restriction of consumption. The price is firm. Export demand is active and output is sold ahead.

CARBON BLACK. Consuming demand is steady at firm prices. Production is proceeding on a large scale.

CLAY. This has become a standard ingredient in tire and mechanical rubber goods factories because of its value as a low cost reenforcing material.

DEGRAS. Improved inquiry for domestic grades with prices steady.

LITHARGE. Protection on prices was extended early in July on current contracts from August 31 to November 30. Reduction of ¼-cent a pound announced July 10. Demand reported routine.

MINERAL RUBBER. M R consumption is well maintained because it so well supplements crude and reclaim in competitive compounding. It is more than a softener, in fact.

SOFTENERS. The many excellent softeners offered afford compounders ample choice of selection to meet their needs in all lines.

V. M. P. NAPHTHA. Consumption of this usual solvent in rubber work is normal. The expected advance in price has not yet taken place.

STEARIC ACID. Price is steady and firm. Demand is quiet as to new business.

ZINC OXIDE. Increased interest is reported due to stability of the metal market. Price and demand are steady.

New York Quotations

July 26, 1929

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09	@
Lead, red	lb.	.10¼	@
sublimed white	lb.	.08½	@
sublimed blue	lb.	.08½	@
super-sublimed white lead	lb.	.08¾	@
Lime, R. M. hydrated	ton	20.00	@
Litharge	lb.	.09¼	@
Magnesia, calcined heavy	ton	75.00	@
Magnesia carbonate	lb.	.06	@ .07
Orange mineral A.A.A.	lb.	.12¼	@

Accelerators, Organic

A-7	lb.	.55	@ .65
A-11	lb.	.62	@ .75
A-16	lb.	.57	@ .65
A-19	lb.	.58	@ .75
A-20	lb.	.64	@ .80
A-32	lb.	.80	@ .95
Aldehyde ammonia	lb.	.65	@ .70
B. B.	lb.		@
Captax	lb.		@
Crylene, hard form	lb.		@
Paste	lb.		@
D. B. A.	lb.	2.00	@
Diorthotoluolguanadine	lb.	.42	@ .46
D. P. G.	lb.	.30	@ .35
Ethylidineaniline	lb.	.60	@ .65
Formaldehydeaniline	lb.	.37½	@ .42½
Grasselerater 102	lb.		@
552	lb.		@
808	lb.		@
833	lb.		@
Heptene	lb.	.40	@
Hexamethylenetetramine	lb.	.48	@ .50
Lead oleate, No. 999	lb.	.15½	@
Witco	lb.	.14	@
Lithex	lb.	.18	@ .20
Methylenedianiline	lb.	.37½	@ .40
Monex	lb.	3.25	@
Plastone	lb.		@
R-2	lb.	2.00	@ 2.50
R. & H. 40	lb.	.40	@ .42½
50	lb.	.40	@ .42½
Safex	lb.	1.20	@
Super-sulphur, No. 1	lb.		@
No. 2	lb.		@
Tensilac No. 39	lb.	.40	@ .42½
No. 41	lb.	.50	@ .52½
Thermlo F.	lb.	.50	@ .55
Thiocarbanilid	lb.	.23	@ .27
Trimene	lb.	.75	@
base	lb.	1.20	@
Tuads	lb.		@
Waxene	lb.	.30	@ .40
ZBX	lb.	2.50	@
Z-88	lb.	.50	@ .60
Zimate	lb.		@

Acids

Acetic 28% (bbls.)	100 lbs.	3.88	@ 4.13
glacial (carboys)	100 lbs.	14.18	@14.43
Sulphuric, 66°	100 lbs.	1.60	@

Alkalies

Caustic soda, 76% solid,	100 lbs.	3.76	@ 3.91

Antioxidants

Age-Rite, powder	lb.		@
resin	lb.		@
white	lb.		@
Albasan	lb.	.70	@ .75
Antox	lb.		@
Grasselerager A	lb.		@
Resistox	lb.		@
Stabilite	lb.		@
Sunproof	lb.	$0.35	@$0.37½
V. G. B.	lb.		@

Colors

BLACK

Bone	lb.	.07	@
Carbon (see compounding ingredients)			
Drop	lb.	.05½	@ .15
Lampblack (commercial)	lb.	.07	@ .08

BLUE

Akco blue	lb.	1.80	@
Huber Brilliant	lb.	4.20	@ 4.70
Prussian	lb.	.35	@ .55
Ultramarine	lb.		@

BROWN

Huber Mocha	lb.	1.60	@ 2.10
Sienna, Italian, raw	lb.	.05½	@ .12½

GREEN

Akco green	lb.	2.60	@
Chrome, light	lb.	.27	@ .31
medium	lb.	.28	@ .31
Huber Brilliant	lb.	4.35	@
Oxide of chromium	lb.	.31	@ .38

ORANGE

Huber Persian	lb.	.50	@ 1.00

RED

Akco red	lb.	2.75	@
Antimony			
Crimson	lb.	.48	@ .53
Sulphur free	lb.	.60	@ .65
Crimson, R. M. P. No. 3	lb.	.48	@
Sulphur, free	lb.	.52	@
Vermilion, No. 5	lb.		@
No. 15	lb.		@
Golden, No. 40	lb.		@
No. 60	lb.		@
15/17%	lb.	.22	@ .25
7-A	lb.	.35	@
Z-2	lb.	.22	@
Aristi	lb.	1.75	@
Huber Brilliant	lb.	1.35	@ 1.85
Iron Oxides			
bright pure domestic	lb.	.12	@
bright pure English	lb.	.12	@
bright reduced English	lb.	.10	@
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.10½	@
Indian (maroon), reduced English	lb.	.07	@
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¼	@
Spanish red oxide	lb.	.03	@ .04¼
Sunburnt red	lb.	.14¼	@
Venetian reds	lb.	.02	@ .06
Vermilion, Eng. quicksilver	lb.		@

Colors—(Continued)

WHITE

Lithopone	lb.	$0.05½	@$0.05¾
Albalith	lb.		@
Azolith	lb.	.05¼	@ .05¾
Grasselli	lb.		@
Sterling	lb.		@
Vanolith	lb.	.05½	@
Titanox	lb.	.08½	@ .09
Zinc Oxide			
AAA (lead free) (bbls.)	lb.	.07	@
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06½	@ .06¾
Z (8% leaded)	lb.	.06½	@ .06¾
Green seal	lb.		@
Kadox	lb.		@
Red seal	lb.		@
Special	lb.		@
White seal	lb.		@
XX green label	lb.		@
XX red label	lb.		@

YELLOW

Akco yellow	lb.	1.45	@
Cadmium sulphide	lb.	.95	@ 1.75
Chrome	lb.	.17	@ .17½
Grasselli cadmium	lb.		@
Huber canary	lb.	3.30	@ 3.80
Ochre, domestic	lb.	.01½	@ .02½
Ochre, French	lb.	.02	@
Oxide, pure	lb.	.08½	@
Zinc, C. P., imported	lb.	.23	@

Compounding Ingredients

Aluminum flake (sacks, c.l.)	ton	21.85	@
(sacks l.c.l.)	ton	24.50	@
Ammonium carb. pwd.	lb.		@
lump	lb.		@
Asbestine	ton	13.40	@14.50
Barium, carbonate	ton	58.00	@60.00
Baryta white (f.o.b. St. Louis, bbls.)	ton	23.00	@
Baryta white (f. o. b. St. Louis, paper bags)	ton	22.20	@
Barytes, pure white	ton	35.00	@
off color	ton	27.50	@
medium	ton	32.50	@
Foam "A" (f. o. b. St. Louis, bbls.)	ton	23.00	@
Foam "A" (f. o. b. St. Louis, bags)	ton	23.00	@
Basofor	lb.	.04½	@
Blanc fixe, dry	lb.	.04½	@
pulp	ton	42.50	@45.00
Carbon Black			
Aerfloted arrow	lb.	.08½	@ .12
Compressed	lb.	.08½	@ .12½
Fumonex	lb.	.06	@ .09
Micronex	lb.	.09	@ .13
Uncompressed	lb.	.08	@ .12
Velvetex	lb.	.04½	@ .06
Carrara filler	ton		@
Chalk	ton	12.00	@
Clay, Blue Ridge, dark	ton		@
Blue Ridge, light	ton		@
China	ton	10.00	@15.00
Dixie	ton		@
Langford	ton		@
Mineral flour (Florida)	ton		@
Perfection	ton	25.00	@
Suprex	ton	10.00	@22.00
Tensulite	ton	10.00	@

Compounding Ingredients *(Continued)*

Cotton flock, black	lb.	$0.13	@
light colored	lb.	.10	@ .11
white	lb.	.12	@ .30
Glue, high grade	lb.	.25	@ .30
low grade	lb.	.16	@ .22
Infusorial earth	ton	45.00	@
Mica, amber	lb.	.04½	@
Neomerpin, S. A. conc.	lb.		@
Pumice stone, powd.	lb.	.02½	@ .04
Rottenstone, domestic	ton	23.50	@28.00
Shellac, fine orange	lb.	.70	@
Soapbark	lb.	.12½	@ .13
Soapstone	ton	15.00	@22.00
Talc, domestic	ton	25.00	@
French	ton	18.00	@22.00
Pyrax A	ton		@
B	ton		@
Thermatomic carbon	lb.		@
Whiting			
Domestic	100 lbs.	1.00	@
English, cliffstone	100 lbs.	1.50	@
Imported chalk	100 lbs.		@
Paris White, English cliffstone	100 lbs.	1.25	@ 1.50
Quaker	ton		@
Slate flour, gray (fact'y)	ton	7.00	@
Snow white	ton		@
Sussex	ton		@
Vancolloid	ton	27.00	@
Vansulite	ton	14.00	@
Westminster Brand	100 lbs.		@
Witco (l. c. l.) (f. o. b. New York)	ton	20.00	@

Factice—See Rubber Substitutes

Mineral Rubber

Fluxrite (solid)	lb.	.05	@ .06
Genasco (fact'y)	ton	50.00	@52.00
Gilsonite (fact'y)	ton	37.14	@39.65
Granulated M. R.	ton		@
Hydrocarbon, hard	ton		@
Hydrocarbon, soft	ton		@
Ohmlac Kapak, M. R.	ton	40.00	@90.00
M-4	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Pioneer, M. R., solid (fact'y)	ton	40.00	@42.00
M. R. granulated	ton	50.00	@52.00
Robertson, M. R., solid (fact'y)	ton	34.00	@80.00
M. R. gran. (fact'y)	ton	38.00	@80.00
Vansul Puro	ton	24.00	@

New York Quotations

July 26, 1929

Oils

Kerosene	gal.	$0.15	@
Mineral	gal.	.20	@
Poppy seed oil	gal.	1.35	@ 1.70
Rapeseed	gal.	.83	@
Red oil, distilled	lb.	.10¾	@ .10⅞
Rubber process	gal.	.25	@
Spindle	gal.	.30	@

Rubber Substitutes or Factice

Black	lb.	.08	@ .14
Brown	lb.	.07½	@ .15
White	lb.	.08½	@ .16

Softeners

Burgundy pitch	100 lbs.	5.00	@ 6.00
Atlas	100 lbs.	6.50	@
Corn oil	lb.	.10	@
Cottonseed oil	lb.	.11	@
Cycline oil	gal.	.26	@ .34
Degras	lb.	.03½	@ .04¼
Fluxrite (fluid)	lb.	.05	@ .06
Moldrite	lb.	.06	@ .06½
Palm oil (Lagos)	lb.	.09	@
Palm oil (Niger)	lb.	.08½	@
Palm oil (Witco)	lb.	.08½	@
Para-flux	gal.	.17	@
Petrolatum, snow white	lb.	.08¾	@ .08⅝
Pigmentar	lb.	.038	@ .0446
Pigmentaroil	lb.		@
Pine oil, steam distilled	gal.	.61	@ .65
Pine tar (retort)	bbl.	11.50	@12.00
Rosin K (bbls.)	280 lbs.	8.80	@
Rosin oil, compounded	gal.	.30	@
No. 3, deodorized	gal.	.60	@
No. 556, deodorized	gal.	.51	@
Rubite	lb.	.10	@
Rubtack	lb.	.08½	@
Stearex	lb.	.15½	@ .20
Stearic acid, double pressed	lb.	.15¼	@ .15¾
Tackol	lb.	.09	@ .15
Tasco W-S No. 1	lb.		@
A	lb.		@
Vansulol	lb.	.11½	@
Vantar (Pine Tar)	gal.	.35	@
Witco No. 20	gal.	.17	@
Woburn oil	lb.	.05½	@ .06

Solvents

Benzol (90% drums)	gal.	$0.28	@
Carbon bisulphide (drums)	lb.	.05½	@ .08
tetrachloride (drums)	lb.	.06½	@ .10
Cyclohexanone	lb.	.70	@
Dip-Sol	gal.	.14	@
Dryolene, No. 9	gal.	.11½	@
Gasoline			
No. 303			
Tankcars	gal.		@
Drums, c. l.	gal.		@
Drums, l. c. l.	gal.		@
Hexalin	lb.	.60	@
acetate	lb.	.70	@
Rub-Sol	gal.	.09	@
Solvent naphtha	gal.	.35	@
Stod-Sol	gal.	.11½	@
Sweet rubber cement naphtha	gal.	.16	@
Turpentine, Venice	lb.	.20	@
steam distilled	gal.	.50½	@ .55

Vulcanizing Ingredients

Sulphur			
Velvet flour (240 lb. bbls.)	100 lbs.	2.95	@ 3.50
(150 lb. bags)	100 lbs.	2.60	@ 3.15
Soft rubber (c.l.)	100 lbs.		@
(l.c.l.)	100 lbs.		@
Superfine commercial flour (210 lb. bbls.)	100 lbs.	2.55	@ 3.10
(100 lb. bags)	100 lbs.	2.40	@ 2.80
Tire brand, superfine,	100 lbs.	1.90	@ 2.25
Tube brand, velvet	100 lbs.	2.40	@ 2.75
Sulphur chloride	lb.	.05	@ .07
Vandex (selenium)	lb.		@
(See also Colors—Antimony)			

Waxes

Beeswax, white, com.	lb.	.55	@
carnauba	lb.	.33	@
ceresine, white	lb.	.12½	@
montan	lb.	.07½	@
ozokerite, black	lb.	.28	@
green	lb.	.28	@
Paraffin			
122/124 crude white scale	lb.	.02¾	@ .02⅞
124/126 crude, white scale	lb.	.02⅞	@
123/125 fully refined	lb.	.04½	@
125/127 fully refined	lb.	.04⅜	@

Rims Approved by Tire & Rim Association

Rim Size	June, 1929 Number	June, 1929 Per Cent	6 Months, 1929 Number	6 Months, 1929 Per Cent
Motorcycle				
24 x 3 "CC"	1,426	0.1	10,464	0.1
24 x 3 Std.	.....	....	4,668	0.0
26 x 3 "CC"	688	0.0	1,971	0.0
26 x 3 Std.	.....	....	1,035	0.0
28 x 3 "CC"	94	0.0	1,114	0.0
18 x 3 SS.	8,546	0.4	14,074	0.1
19 x 3 SS.	3,477	0.2	10,516	0.1
Clincher				
30 x 3½	16,227	0.7	135,424	1.0
31 x 4	765	0.0	765	0.0
18" Balloons				
18 x 4	158,172	7.2	828,802	5.8
18 x 3.25	.....	....	75,681	0.5
18 x 4½	54,469	2.7	235,912	1.7
18 x 5	30,144	1.4	53,628	0.4
19" Balloons				
19 x 2.75	22,721	1.0	218,600	1.5
19 x 3½	56,234	2.6	474,041	3.3
19 x 4	295,524	13.8	2,719,827	19.2
19 x 3.25	20,104	0.9	181,687	1.3
19 x 4½	83,494	3.8	372,063	2.6
19 x 5	15,917	0.7	75,170	0.5
20" Balloons				
20 x 2.75	646,526	29.6	3,684,632	25.9
20 x 3½	.....	....	62,217	0.4
20 x 4	142,866	6.5	1,354,265	9.6
20 x 4½	25,631	1.2	236,868	1.7
20 x 5	7,403	0.3	224,439	1.6
20 x 6	800	0.0	35,783	0.3
20 x 6.75	.....	....	12,206	0.1
21" Balloons				
21 x 2.75	13,668	0.6	107,288	0.8
21 x 3½	42,909	2.0	182,612	1.3
21 x 4	10,054	0.5	45,934	0.3
21 x 4½	9,281	0.4	28,770	0.2
21 x 5	902	0.0	4,046	0.0
21 x 6	1,488	0.1	2,505	0.0

Rim Size	June, 1929 Number	June, 1929 Per Cent	6 Months, 1929 Number	6 Months, 1929 Per Cent
22" Balloons				
22 x 4	408	0.0	909	0.0
22 x 4½	405	0.0	901	0.0
High Pressure				
30 x 3½—23	329	0.0	16,979	0.1
31 x 4 —23	1,086	0.1	1,086	0.0
32 x 4½—23	4,541	0.2	29,718	0.2
32 x 4 —24	3,155	0.1	14,774	0.1
32 x 3½—25	.....	....	1,056	0.0
34 x 4½—25	.....	....	2,181	0.0
20" Truck				
30 x 5	411,246	18.8	2,157,194	15.2
32 x 6	48,672	2.2	280,328	2.0
34 x 7	16,471	0.8	102,177	0.7
36 x 8	8,537	0.4	71,042	0.5
40 x 10	.....	....	304	0.0
22" Truck				
36 x 7	.....	....	1,924	0.0
38 x 8	911	0.0	7,110	0.1
24" Truck				
34 x 5	.....	....	3,064	0.0
36 x 6	2,163	0.1	23,201	0.2
38 x 7	4,471	0.2	30,838	0.2
40 x 8	7,260	0.3	41,597	0.3
44 x 10	.....	....	246	0.0
Airplane				
8 x 3	.....	....	245	0.0
12 x 3	912	0.0	1,669	0.0
14 x 3	81	0.0	101	0.0
16 x 3	43	0.0	43	0.0
18 x 3	.....	....	581	0.0
16 x 3½	35	0.0	1,051	0.0
20 x 3½	1,804	0.1	4,068	0.0
26 x 4	1,032	0.0	1,546	0.0
20 x 5	10	0.0	221	0.0
20 x 6	166	0.0	534	0.0
20 x 8	18	0.0	428	0.0
24 x 10	.....	....	109	0.0
18 x 4 Clincher	933	0.0	7,730	0.1
Totals	2,184,219	....	14,201,962	....

Cotton and Fabrics

AMERICAN COTTON. The price of spot middling cotton on July 1 was 18.20 cents compared with 18.40 cents on June 1. From the first to the ninth the price rose to 18.70 cents, declining from that level to 18.00 cents by the fifteenth. In the week ended July 20 the market was very active, spot advancing from 18.00 cents on Monday to 19.45 cents on Saturday.

The government report, published on the ninth, placed the area under cultivation as of July 1 at 48,457,000 acres, indicating under average conditions a yield of about 15,150,000 bales. This is within 100,000 bales of the world's consumption of American cotton.

The probable damage to the crop in the Mississippi Valley and the Atlantic states is threatened with unusual damage by the boll weevil unless extremely hot and dry weather prevails for the next few weeks.

The Department of Agriculture has created a committee on cotton research composed of 11 specialists appointed by Dr. Woods, director of scientific work, to pursue a "well balanced program of research" of American cotton problems. Some of the problems suggested for study include extended soil surveys in the cotton belt; investigation of the physical and chemical properties of cotton fibers as aid to cotton breeding and the determination of the factors influencing the spinning quality of cotton; reexamination of the principles of cotton breeding that suitable varieties may be established for different sections; wholesale methods of prevention and control of damage by insect pests, etc.; revision of cotton standards; utilization of cotton; and market problems, foreign and domestic.

ARIZONA COTTON. In Arizona the crop is reported doing well, and a yield of approximately 35,000 bales of Pimas is in prospect.

EGYPTIAN COTTON. Egyptians have been weak on good crop prospects and lack of aggressive buying by spinners. This is the period when the new crop prospects are dominant, and it is very difficult to see ahead. However, the statistical position is strong, and on the basis of world consumption of staples last year a large production will be necessary to supply all its needs in the current year.

In mid-July staple crops everywhere were reported doing well. The only anxiety expressed in Egypt was over the lateness of the crop, while in the Delta area in America stands were inclined to be irregular.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The low prices of fabrics relative to raw-material cost noted last month have been emphasized by the sharp rise of $5 a bale, July 20-22. Fabric prices are struggling to follow, but do so haltingly. With the passing of July the cloth market becomes more two-sided. The seller has time in his favor owing to the reputed minimum of supplies in the possession of jobbers and consumers and the consequent growing necessity of replenishing with the approach of the season for renewal of normal activity.

RAINCOAT FABRICS. The condition of the raincoat trade has been stationary for the past eight weeks. A slight improvement noted since mid-July marks the usual fall revival of business in this line.

SHEETINGS. The activity of the market raised the value of raw cotton one cent a pound, and sheetings have advanced to correspond. The fabric market is in excellent position and warrants expectation of steady volume of trade for the rest of the summer with marked increase in early fall. The mills are not anxious to sell goods for the fourth quarter at prevailing prices.

TIRE FABRICS. Daily reports on the demand and prices for tire fabrics showed seasonal falling off in consumption, the market being generally quiet and prices unchanged. Buyers found tire fabric mills disposed to hold their quotations very firm although some price concessions were made on accessory fabrics. Around 46 cents was considered the correct level to quote on 23s 5-3 ply carded peeler cords.

New York Quotations

July 26, 1929

Drills

38-inch 2.00-yard	yard	$0.16¾@
40-inch 3.47-yard		.10⅛@
50-inch 1.52-yard		.22⅜@
52-inch 1.90-yard		.18⅛@
52-inch 2.20-yard		.15⅞@
59-inch 1.85-yard		.19½@

Ducks

38-inch 2.00-yard D. F.	yard	.17½@
40-inch 1.45-yard S. F.		.23¾@
72-inch 1.05-yard D. F.		.36⅜@
72-inch 16.66-ounce		.39½@
72-inch 17.21-ounce		.40⅜@

MECHANICAL

Hose and belting	pound	.37 @

TENNIS

52-inch 1.35-yard	yard	.26½@

Hollands

R.T.5—30-inch	yard	.16 @
R.T.7—36-inch		.18 @
R.T.8—40-inch		.20 @
48A—32-inch		.12½@
48A—40-inch		.15½@

RED SEAL

36-inch		.15½@
40-inch		.16½@
50-inch		.25 @

GOLD SEAL

40-inch, No. 72		.20¾@
40-inch, No. 80		.22 @

Osnaburgs

40-inch 2.35-yard	yard	$0.14½@
40-inch 2.48-yard		.13¾@
40-inch 3.00-yard		.11½@
40-inch 10-oz. part waste	lb.	.18¼@
40-inch 7-oz.	lb.	.12¾@
37-inch 2.42-yard	yard	.14 @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	.10½@
Bombazine 60 x 48		.09½@
Plaids 60 x 48		.12½@
Plaids 48 x 48		.11½@
Surface prints 64 x 60		.13½@
Surface prints 60 x 48		.12½@
Print cloth, 38½-in., 60 x 48		.06⅜@
Print cloth, 38½-in., 64 x 60		.07⅜@

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.12⅜@	
48 x 48, 2.85-yard		.10¾@	
64 x 68, 3.15-yard		.11¼@	
56 x 60, 3.60-yard		.09¼@	.09⅜
44 x 48, 3.75-yard		.08¼@	.08⅜
44 x 40, 4.25-yard		.07⅛@	.07¼

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.06⅝@	.06¾
44 x 40, 6.15-yard		.05½@	.05¾

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Peeler, karded	pound	$0.47 @

BUILDER 23/11

Peeler, karded	pound	.47 @

BUILDER 10/5

Peeler, karded	pound	.44 @

CORD 23/5/3

Peeler, karded, 1 1/16-in.	pound	.46 @

CORD 23/4/3

Peeler, karded	pound	.49 @

CORD 23/3/5

Peeler, karded	pound	.50 @

CORD 15/3/5

Peeler, karded	pound	.45 @

CORD 13/3/3

Peeler, karded	pound	.44 @

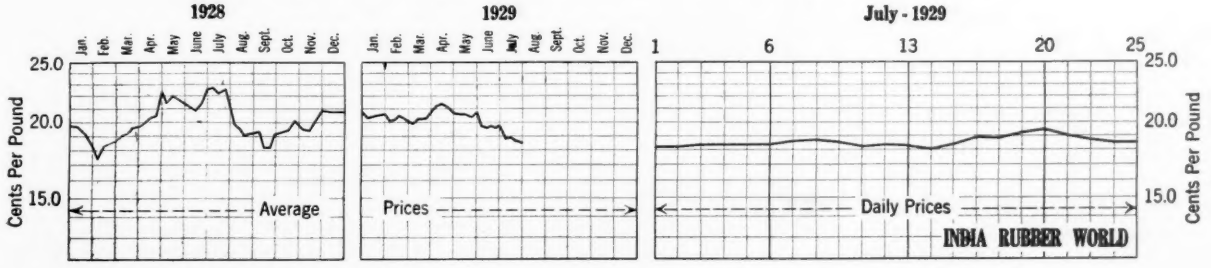
LENO BREAKER

8-oz. Peeler, karded	pound	.47 @
10-oz. Peeler, karded		.47 @

CHAFER

9.5-oz. Peeler, karded	pound	.47 @
12-oz. Peeler, karded		.47 @
14-oz. Peeler, karded		.47 @

Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton



Crude Rubber Arrivals at New York as Reported by Importers

Plantations

JUNE 16. By "Pres. McKinley," Far East.

	Cases
Littlejohn & Co., Inc.	†886
The Meyer & Brown Corp.	†350
Poel & Kelly, Inc.	†470

JUNE 17. By "Caronia," Far East.

The Meyer & Brown Corp.	702

JUNE 17. By "Nairnbank," Far East.

H. A. Astlett & Co.	809
Robert Badenhop Corp.	975
Baird Rubber & Trading Co., Inc.	430
Bierrie & Co., Inc.	640
General Rubber Co.	4,389
Littlejohn & Co., Inc.	3,388
The Meyer & Brown Corp.	2,010
Poel & Kelly, Inc.	373
Raw Products Co.	290
Rogers Brown & Crocker Bros., Inc.	1,974
Rogers Brown & Crocker Bros., Inc.	*270
Chas. T. Wilson Co., Inc.	380

JUNE 19. By "Silverbelle," Far East.

H. A. Astlett & Co.	3,208
Robert Badenhop Corp.	350
Baird Rubber & Trading Co., Inc.	575
Paul Bertuch & Co., Inc.	200
Bierrie & Co., Inc.	847
N. Diamond & Co., Inc.	101
General Rubber Co.	6,420
Haldane & Co., Inc.	800
B. W. Henderson & Co., Inc.	50
Lavino American & Asiatic Co.	256
Littlejohn & Co., Inc.	4,498
The Meyer & Brown Corp.	1,550
The Meyer & Brown Corp.	*50
Poel & Kelly, Inc	500
Poel & Kelly, Inc.	*250
Raw Products Co.	230
Rogers Brown & Crocker Bros., Inc.	1,795
Chas. T. Wilson Co., Inc.	843

JUNE 20. By "Reliance," Far East.

H. A. Astlett & Co.	100
The Meyer & Brown Corp.	101

JUNE 20. By "Thuringa," Far East.

The Meyer & Brown Corp.	160

JUNE 22. By "Knoxville City," Far East.

H. A. Astlett & Co.	220
Robert Badenhop Corp.	53
General Rubber Co.	56
B. W. Henderson & Co., Inc.	56
Hood Rubber Co.	*75
Littlejohn & Co., Inc.	100
The Meyer & Brown Corp.	470
Chas. T. Wilson Co., Inc.	86

JULY 23. By "Bengkalis," Far East.

Chas. T. Wilson Co., Inc.	†350

JUNE 23. By "Chile Maru," Europe.

Littlejohn & Co., Inc.	50

JUNE 23. By "Tampa," Far East.

H. A. Astlett & Co.	3,557
Robert Badenhop Corp.	360
Baird Rubber & Trading Co., Inc.	28
General Rubber Co.	6,294
Haldane & Co., Inc.	450
B. W. Henderson & Co., Inc.	250
Lavino American & Asiatic Co.	250
Littlejohn & Co., Inc.	5,108
The Meyer & Brown Corp.	1,885
Raw Products Co.	570
Rogers Brown & Crocker Bros., Inc.	3,472
Chas. T. Wilson Co., Inc.	165

JUNE 24. By "Baltic," London.

Chas. T. Wilson Co., Inc.	71

JUNE 24. By "Franconia," London.

Chas. T. Wilson Co., Inc.	50

JUNE 24. By "Minnekahda," Far East.

The Meyer & Brown Corp.	142
Chas. T. Wilson Co., Inc.	614

JUNE 24. By "Silveroak" Far East.

Robert Badenhop Corp.	†805
Littlejohn & Co., Inc.	†940
The Meyer & Brown Corp.	†100
H. Muehlstein & Co., Inc.	†360
Poel & Kelly, Inc.	†342

*Arrived at Boston.
†Arrived at Los Angeles.
‡Arrived at San Francisco.
**Arrived at Oakland.

JUNE 25. By "City of Lincoln," Far East.

	Cases
H. A. Astlett & Co.	213
Robert Badenhop Corp.	147
Baird Rubber & Trading Co., Inc.	100
Bierrie & Co., Inc.	541
General Rubber Co.	1,654
B. W. Henderson & Co., Inc.	150
Littlejohn & Co., Inc.	506
The Meyer & Brown Corp.	224
Rogers Brown & Crocker Bros., Inc.	1,300
Chas. T. Wilson Co., Inc.	50

JUNE 25. By "Franconia," Far East.

H. A. Astlett & Co.	73

JUNE 25. By "Golden Hind," Far East.

Robert Badenhop Corp.	†250
The Meyer & Brown Corp.	†500
Chas. T. Wilson Co., Inc.	†500

JUNE 25. By "Pres. Van Buren," Far East.

H. A. Astlett & Co.	1,975
Robert Badenhop Corp.	1,120
Baird Rubber & Trading Co., Inc.	356
Bierrie & Co., Inc.	162
N. Diamond & Co., Inc.	25
General Rubber Co.	4,208
B. W. Henderson & Co., Inc.	316
Hood Rubber Co.	*264
Littlejohn & Co., Inc.	2,780
The Meyer & Brown Corp.	785
Poel & Kelly, Inc.	140
Raw Products Co.	460
Rogers Brown & Crocker Bros., Inc.	725
Chas. T. Wilson Co., Inc.	1,105

JUNE 26. By "Golden Dragon," Far East.

Robert Badenhop Corp.	†250
The Meyer & Brown Corp.	†250
Chas. T. Wilson Co., Inc.	†750

JUNE 26. By "Malakand," Far East.

General Rubber Co.	1,430
B. W. Henderson & Co., Inc.	100
Hood Rubber Co.	*25
Chas. T. Wilson Co., Inc.	338

JUNE 26. By "Rhexenor," Far East.

H. A. Astlett & Co.	3,518
Robert Badenhop Corp.	411
Baird Rubber & Trading Co., Inc.	350
Baird Rubber & Trading Co., Inc.	*50
Bierrie & Co., Inc.	180
General Rubber Co.	7,073
Haldane & Co., Inc.	460
B. W. Henderson & Co., Inc.	577
Hood Rubber Co.	137
Lavino American & Asiatic Co.	125
Littlejohn & Co., Inc.	5,524
The Meyer & Brown Corp.	2,829
The Meyer & Brown Corp.	*300
H. Muehlstein & Co., Inc.	706
Poel & Kelly, Inc.	490
Rogers Brown & Crocker Bros., Inc.	1,471
Chas. T. Wilson Co., Inc.	1,304

JUNE 27. By "Taiyo Maru," Far East.

H. A. Astlett & Co.	†488
Littlejohn & Co., Inc.	†250
The Meyer & Brown Corp.	†451
H. Muehlstein & Co., Inc.	†250

JUNE 28. By "Blydendyk," Far East.

H. A. Astlett & Co.	1,756
Robert Badenhop Corp.	671
Baird Rubber & Trading Co., Inc.	50
Paul Bertuch & Co., Inc.	236
Bierrie & Co., Inc.	704
N. Diamond & Co., Inc.	62
General Rubber Co.	3,096
B. W. Henderson & Co., Inc.	270
Littlejohn & Co., Inc.	2,694
The Meyer & Brown Corp.	1,011
The Meyer & Brown Corp.	*451
Poel & Kelly, Inc.	127
Raw Products Co.	100
Rogers Brown & Crocker Bros., Inc.	4,730
Rogers Brown & Crocker Bros., Inc.	*247
Chas. T. Wilson & Co., Inc.	554

JULY 1. By "Kertosono," Far East.

H. A. Astlett & Co.	†337
Robert Badenhop Corp.	†100
General Rubber Co.	†1,600
Haldane & Co., Inc.	†250
Littlejohn & Co., Inc.	†115
The Meyer & Brown Corp.	†1,215
H. Muehlstein & Co., Inc.	†2,400
Chas. T. Wilson Co., Inc.	†570
Chas. T. Wilson Co., Inc.	**100

JULY 1. By "Minnewaska," London.

	Cases
H. A. Astlett & Co.	55
General Rubber Co.	30
Littlejohn & Co., Inc.	700
H. Muehlstein & Co., Inc.	450

JULY 1. By "Pres. Grant," Far East.

H. A. Astlett & Co.	†250
Haldane & Co., Inc.	†500
Littlejohn & Co., Inc.	†696
Littlejohn & Co., Inc.	†50
H. Muehlstein & Co., Inc.	†800
Poel & Kelly, Inc.	†330

JULY 1. By "Silverpine," Far East.

Robert Badenhop Corp.	†700
Bierrie & Co., Inc.	†250
Haldane & Co., Inc.	†250
Littlejohn & Co., Inc.	†1,200
H. Muehlstein & Co., Inc.	†850
Poel & Kelly, Inc.	†225
Chas. T. Wilson Co., Inc.	†30

JULY 8. By "City of Lille," Far East.

H. A. Astlett & Co.	1,578
Robert Badenhop Corp.	512
Bierrie & Co., Inc.	120
General Rubber Co.	1,673
Haldane & Co., Inc.	250
Lavino American & Asiatic Co.	100
Littlejohn & Co., Inc.	1,626
The Meyer & Brown Corp.	1,260
H. Muehlstein & Co., Inc.	275
Raw Products Co.	50
Rogers Brown & Crocker Bros., Inc.	2,275
Rogers Brown & Crocker Bros., Inc.	*450
Chas. T. Wilson Co., Inc.	510

JULY 8. By "London Merchant," London.

The Meyer & Brown Corp.	569

JULY 8. By "Minnesota," Europe.

Littlejohn & Co., Inc.	355
H. Muehlstein & Co., Inc.	475

JULY 8. By "Scythia," London.

H. A. Astlett & Co.	50
Littlejohn & Co., Inc.	25
H. Muehlstein & Co., Inc.	80

JULY 9. By "Pres. Hayes," Far East.

H. A. Astlett & Co.	195
Robert Badenhop Corp.	300
Baird Rubber & Trading Co., Inc.	95
Paul Bertuch & Co., Inc.	56
Bierrie & Co., Inc.	390
General Rubber Co.	3,997
Haldane & Co., Inc.	450
Hood Rubber Co.	*176
Littlejohn & Co., Inc.	2,459
The Meyer & Brown Corp.	1,011
H. Muehlstein & Co., Inc.	800
Poel & Kelly, Inc.	10
Rogers Brown & Crocker Bros., Inc.	1,742
Chas. T. Wilson Co., Inc.	237

JULY 9. By "Tenyo Maru," Far East.

H. A. Astlett & Co.	†272
The Meyer & Brown Corp.	†100
H. Muehlstein & Co., Inc.	†460

JULY 12. By "Silvermaple," Far East.

H. A. Astlett & Co.	3,851
Robert Badenhop Corp.	1,596
Baird Rubber & Trading Co., Inc.	68
Paul Bertuch & Co., Inc.	900
Bierrie & Co., Inc.	668
General Rubber Co.	4,309
Haldane & Co., Inc.	450
Lavino American & Asiatic Co.	158
Littlejohn & Co., Inc.	3,347
The Meyer & Brown Corp.	1,395
The Meyer & Brown Corp.	*300
H. Muehlstein & Co., Inc.	350
Poel & Kelly, Inc.	615
Raw Products Co.	300
Rogers Brown & Crocker Bros., Inc.	1,478
Chas. T. Wilson Co., Inc.	658

JULY 13. By "Royal Prince," Far East.

H. A. Astlett & Co.	2,419
Robert Badenhop Corp.	447
Baird Rubber & Trading Co., Inc.	56
Paul Bertuch & Co., Inc.	56
Bierrie & Co., Inc.	742
General Rubber Co.	4,532
Haldane & Co., Inc.	528
Hood Rubber Co.	*328
Lavino American & Asiatic Co.	50
Littlejohn & Co., Inc.	7,581
The Meyer & Brown Corp.	1,792
H. Muehlstein & Co., Inc.	850
H. Muehlstein & Co., Inc.	*457
Poel & Kelly, Inc.	*100
Rogers Brown & Crocker Bros., Inc.	2,755
Chas. T. Wilson Co., Inc.	1,165

	Cases
JULY 14. By "Pres. Cleveland," Far East.	
H. A. Astlett & Co.	†250
Robert Badenhop Corp.	†530
Haldane & Co., Inc.	†250
Littlejohn & Co., Inc.	†760
The Meyer & Brown Corp.	†110
JULY 15. By "Minnetonka," Far East.	
Bierrie & Co., Inc.	166
JULY 15. By "Simaloer," Far East.	
H. A. Astlett & Co.	1,100
Bierrie & Co., Inc.	650
N. Diamond & Co., Inc.	23
Haldane & Co., Inc.	352
Lavino American & Asiatic Co.	22
Littlejohn & Co., Inc.	1,690
The Meyer & Brown Corp.	1,345
H. Muehlstein & Co., Inc.	941
Rogers Brown & Crocker Bros., Inc.	1,750

†Arrived at Los Angeles.

Africans

	Cases
JUNE 17. By "Samaria," Europe.	
Littlejohn & Co., Inc.	9
JUNE 20. By "Sarcoxie," Europe.	
Baird Rubber & Trading Co., Inc.	15
JUNE 28. By "Schodack," Europe.	
Littlejohn & Co., Inc.	439

Balata

JUNE 28. By "Sheridan," South America.	
Paul Bertuch & Co., Inc.	146
JULY 10. By "Stephen," South America.	
Paul Bertuch & Co., Inc.	131

Guayule

	Cases
JUNE 18. By "El Oceana," Mexico.	
Continental Rubber Co. of N. Y.	1,120
JUNE 25. By "El Oriente," Mexico.	
Continental Rubber Co. of N. Y.	560
JULY 5. By "El Occidente," Mexico.	
Continental Rubber Co. of N. Y.	560
JULY 9. By "El Mundo," Mexico.	
Continental Rubber Co. of N. Y.	560

Rubber Latex

JUNE 19. By "Silverbelle," Far East.	
General Rubber Co.	gals. 145,324
Littlejohn & Co., Inc.	drums 25
JULY 12. By "Silvermaple," Far East.	
General Rubber Co.	gals. 142,143

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
JUNE 14. By "Francis," South America.					
H. A. Astlett & Co.	203	....	290	157	....
The Meyer & Brown Corp.	595	....	....	....	....
JUNE 20. By "Tintoretto," South America.					
H. A. Astlett & Co.	90	....	90	14	....
Paul Bertuch & Co., Inc.	670	....	60	160	....
Littlejohn & Co., Inc.	269	....	1	....	....
The Meyer & Brown Corp.	62	....	....	....	....
JUNE 28. By "Sheridan," South America.					
H. A. Astlett & Co.	166	....	81	144	....
Paul Bertuch & Co., Inc.	....	....	....	325	....
General Rubber Co.	259	....	90	164	*1
Littlejohn & Co., Inc.	177	....	....	....	....
The Meyer & Brown Corp.	971	....	....	....	....
JULY 10. By "Stephen," South America.					
H. A. Astlett & Co.	....	....	40	146	....
General Rubber Co.	213	....	92	....	....
Littlejohn & Co., Inc.	14	1	1	10	....
The Meyer & Brown Corp.	115	....	....	443	....
H. Muehlstein & Co., Inc.	51	46	....	....	....

*Mixed.

United States Crude and Waste Rubber Imports for 1929 by Months

1929	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1929	Total 1928	Balata	Miscellaneous	Waste
January ..... tons	51,202	1,055	30	5	....	13	52,305	46,243	67	799	181
February	63,851	530	60	97	....	..	64,538	29,445	80	1,220	319
March	51,661	2,112	15	36	....	..	53,824	40,894	85	825	70
April	53,256	844	8	4	59	..	54,171	37,240	87	1,606	609
May	47,940	1,078	54	49	59	..	49,180	32,883	88	1,013	230
June	43,313	1,032	44	1	100	..	44,490	25,792	91	1,323	215
Total six months, 1929 ..... tons	311,223	6,651	211	192	218	13	318,508	.....	498	6,786	1,624
Total six months, 1928 ..... tons	201,489	6,770	684	377	3,176	1	.....	212,497	619	5,088	1,713

Compiled from Rubber Manufacturers Association statistics.

Crude Rubber Imports by Customs Districts

	*May, 1929 Pounds	*May, 1929 Value	Five Months Ended *May, 1929 Pounds	Five Months Ended *May, 1929 Value
Massachusetts	2,930,468	$596,525	17,899,471	$3,293,286
New York	97,551,183	20,609,288	544,255,172	102,802,526
Philadelphia	1,014,798	223,725	2,697,893	506,924
Maryland	1,237,177	276,533	12,174,571	2,208,269
Los Angeles	8,007,188	1,891,942	29,062,185	5,678,961
San Francisco	143,058	27,610	741,378	157,072
Oregon	11,206	2,006	78,400	14,138
Chicago	.....	.....	17,148	3,430
Ohio	3,314,054	633,639	16,764,013	2,843,130
Colorado	448,000	103,563	2,150,400	432,913
Totals	114,657,126	$24,364,831	625,840,631	$117,940,649

*Including latex, dry rubber content.

Plantation Rubber Exports from Malaya*

	January 1 to April 30, 1929 From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	2,058.00	3,621.00	3,064.00
British Possessions	1,871.00	257.00	72.00
Continent of Europe	9,788.00	2,428.00	2,487.00
United States	66,752.00	19,180.00	8,189.00
Japan	5,222.00	20.00	304.00
Other countries	371.00	50.00	.....
Totals	86,062.00	25,556.00	14,116.00

*Excluding all foreign transhipment.

British Malaya

RUBBER EXPORTS

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S. W. 1, England, states that the amount of rubber exported from British Malaya in June last totaled 40,398 tons as compared with 43,960 tons in May last, and 22,930 tons in the corresponding period of 1928. The amount of rubber imported was 14,344 tons, of which 10,443 tons were declared as wet rubber. The following are comparative statistics:

	1928 Gross Exports Tons	1928 Foreign Imports Tons	1929 Gross Exports Tons	1929 Foreign Imports Tons
January	27,731	16,618	52,546	13,415
February	28,813	12,911	47,926	12,103
March	27,813	10,508	49,448	14,553
April	20,029	9,335	49,816	11,414
May	26,403	10,350	43,960	15,593
June	22,930	16,168	40,398	14,344
Totals	153,719	75,890	284,094	81,422

The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of May and June:

	May, 1929 Tons	June, 1929 Tons
United Kingdom	5,477	7,242
United States	30,966	26,883
Continent of Europe	4,257	3,969
British Possessions	1,583	898
Japan	1,525	1,287
Other foreign countries	152	119
Totals	43,960	40,398

Dominion of Canada Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	March, 1929		Twelve Months Ended March, 1929	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.	11,111,991	$2,670,534	77,704,034	$17,410,004
Rubber recovered	2,514,600	170,842	17,859,800	1,249,060
Rubber and gutta percha scrap	705,600	27,064	6,704,600	272,441
Balata	50	75	12,857	5,198
Rubber substitutes	129,300	22,310	1,173,500	196,163
Totals	14,461,541	$2,890,825	103,454,791	$19,132,866
PARTLY MANUFACTURED				
Hard rubber sheets and rods	4,782	$2,833	51,205	$33,891
Hard rubber tubes	.....	2,876	.....	16,303
Rubber thread not covered	20,469	19,033	228,701	240,635
Totals	25,251	$24,742	279,906	$290,829
MANUFACTURED				
Belting	.....	$27,832	.....	$179,758
Hose	.....	23,895	.....	223,841
Packing	.....	9,512	.....	70,200
Boots and shoes.....*pairs*	5,236	8,099	183,114	222,792
Clothing, including waterproofed	.....	124,081	.....	626,036
Gaskets	.....	1,774	.....	1,774
Gloves	.....	3,669	.....	21,884
Hot water bottles	.....	3,591	.....	34,030
Tires, pneumatic.....*number*	4,372	16,472	41,967	249,262
Inner tubes .....*number*	111	584	21,019	31,238
Solid .....*number*	67	8,745	754	46,988
Mats and matting	.....	22,574	.....	152,371
Cement	.....	11,807	.....	71,896
Golf balls.....*dozen*	6,118	19,713	31,251	119,839
Heels rubber.....*pairs*	256,796	13,418	1,587,556	88,657
Other rubber manufactures	.....	173,153	.....	1,526,722
Totals	.....	$468,919	.....	$3,667,288
Totals, rubber imports	.....	$3,384,486	.....	$23,090,983

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

UNMANUFACTURED	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Waste rubber	$32,308	.....	$258,835	.....
Totals	$32,308	.....	$258,835	.....
MANUFACTURED				
Belting	$33,013	.....	$450,956	.....
Canvas shoes with rubber soles	698,695	.....	5,177,217	.....
Boots and shoes	225,687	.....	3,412,632	.....
Clothing, including waterproofed	2,339	.....	30,461	.....
Hose	27,179	.....	268,698	.....
Tires, pneumatic	2,098,596	.....	16,655,471	.....
Inner tubes	269,661	.....	2,464,368	.....
Solid	18,801	.....	313,314	.....
Other rubber manufactures	197,525	$11,440	1,550,562	$89,825
Totals	$3,571,496	$11,440	$30,323,679	$89,825
Totals, rubber exports	$3,603,804	$11,440	$30,582,514	$89,825

Ceylon Rubber Exports

January 1 to May 15, 1929

	Tons
To United Kingdom	5,080.77
Continent	3,212.73
Australia	1,184.85
America	19,686.88
Egypt	4.00
Africa	3.80
India	22.72
Japan	133.81
Total	29,329.56
For the same period last year	17,351.69

Annual Exports, 1921-1928

	Tons
For the year 1928	57,825.48
1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

Low and High New York Spot Prices

PLANTATIONS	1929*	July 1928	1927
First latex crepe	$0.21¼@$0.23⅝	$0.19 @$0.20	$0.34½@$0.35⅞
Smoked sheet, ribbed	.20⅝@ .22½	.18¾@ .19⅞	.34¼@ .35⅜
PARAS			
Upriver, fine	.21⅝@ .22¾	.21½@ .23	.29½@ .31
Upriver, coarse	.12 @ .12¾	.13¾@ .15	.19½© .21
Islands, fine	... @ ...	.18 @ .20¾	.26½@ .28

* Figured to July 26, 1929.

World Rubber Production—Net Exports

British Malaya:	Total 1928	Long Tons—1929 Jan.	Feb.	Mar.	Apr.	May	June
Gross exports	409,500	52,546	47,926	49,448	49,816	43,960	40,398
Imports	149,787	13,415	12,103	14,553	11,414	15,593	14,344
Net	259,713	39,131	35,823	34,895	38,402	28,367	26,054
Ceylon	57,267	8,301	6,943	6,713	4,676	4,850	6,051
India and Burma	10,790	1,664	1,117	1,413	727	800	.....
Sarawak	10,087	873	955	758	747	966	1,061
B. N. Borneo	6,698	*500	*500	*500	*500	*500	*500
Siam	4,813	461	495	499	306	453	422
Java and Madura	58,848	5,640	6,572	5,515	5,997	6,264	.....
Sumatra E. Coast	82,511	8,067	7,511	6,620	6,645	6,961	.....
Other N. E. Indies	121,671	11,535	10,384	10,629	11,321	13,437	.....
French Indo-China	9,616	395	965	741	568	650	608
Amazon Valley	21,129	2,134	2,104	2,332	1,950	1,922	1,398
Other America	1,490	68	179	155	57	.....	.....
Mexican Guayule	3,076	—	—	—	83	125	.....
Africa	6,124	574	341	631	.....	.....	.....
Totals	653,833	79,343	73,889	71,401	.....	.....	.....

*Estimated.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Absorption—Net Imports

	Total 1928	Long Tons—1929 Jan.	Feb.	Mar.	Apr.	May
Australia	8,430	1,061	1,131	725	1,518	1,437
Belgium	7,958	749	627	931	750	854
Canada	30,447	3,759	2,908	4,961	3,177	2,937
Czechoslovakia	3,138	525	356	409	445	.....
Denmark	566	38	49	60	62	57
Finland	768	62	34	5	104	101
France	35,498	5,645	5,001	4,409	4,854	.....
Germany	37,855	4,711	4,613	4,586	5,351	3,682
Italy	12,433	1,481	1,259	1,515	1,407	.....
Japan	25,621	3,776	2,727	2,630	2,308	.....
Netherlands	2,243	218	113	316	144	201
Norway	728	70	48	55	63	.....
Russia	15,134	956	684	716	689	.....
Spain	3,178	179	115	80	40	.....
Sweden	2,356	468	95	234	727	.....
United Kingdom	4,846	11,951	5,179	9,068	8,295	5,112
United States	404,496	53,922	61,331	46,391	52,447	48,350
U. S. (Guayule)	3,076	—	—	—	83	125
Totals	599,771	89,571	86,270	77,091	82,464	.....

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Stocks

Producing Centers	Long Tons—1929 Jan.	Feb.	Mar.	Apr.	May	June
Singapore	24,770	27,177	25,326	23,202	26,764	25,641
Penang	4,847	5,196	4,111	4,137	5,168	6,220
Para	3,421	3,881	3,518	3,392	3,310	4,475
Totals	33,038	36,254	32,955	30,731	35,242	36,336
Manufacturing Centers						
London	25,191	25,554	28,214	31,368	31,270	.....
Liverpool	3,775	4,105	4,326	4,590	4,537	.....
Amsterdam	1,289	1,119	944	931	1,315	.....
United States	76,342	90,058	100,537	107,659	97,192	92,062
Plantation Afloat*	91,300	87,250	85,700	91,200	83,290	.....
Totals	197,897	208,086	219,721	235,748	217,604	.....
Grand Totals	230,935	244,340	252,676	266,479	252,846	.....

*W. H. Rickinson & Son, *The World's Rubber Position.*
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Gross Malayan Rubber Exports Declined in June

Shipments of crude rubber from British Malaya during the month of June declined 3,562 long tons, a cable to the Rubber Exchange reported last month. Gross exports amounted to 40,398 tons, as against 43,960 tons in May. The exports for the United States at the same time underwent a reduction of 4,083 tons from the preceding month, the cable revealed, shipments to this country in June amounting to 26,883 tons, as against 30,966 tons during May.

The June shipments from Malaya, compared with the previous month and with June, 1928, follow:

	1929 June	1929 May	1928 June
Gross exports	40,398	43,960	22,930
Imports	14,344	15,593	16,168
To United States	26,883	30,966	15,617
To United Kingdom	7,242	3,477	2,947

For Bigger Production

that they can depend on—

experienced rubber men are using WILLIAMS machines

YOU too can profit by our unequalled experience in serving the rubber industry—more than 40 years of close contact.

When you buy "WILLIAMS" machines, you get many improvements that have been developed by years of service—thoroughly *seasoned* machines that speed up production and assure a steadier output—

WILLIAMS "Rapido" Tubers, that have given 50% to 70% greater output with lower temperature; WILLIAMS Automatic Tube Molding machines that have produced 2 to 3 times as many tubes per operator; scientifically designed outside packed heater presses—*the complete line of rubber machinery*—

Each machine setting the pace for quantity production, and built with the stamina to stand its faster pace.

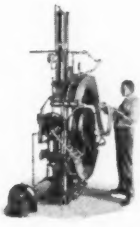
And now—new facilities for giving better service

Our big new Erie, Pa., plant is now in operation, fully equipped to maintain the high standards of accuracy for which WILLIAMS machines have always been noted, with better service than ever before possible.

It will pay you, as it has other manufacturers, to get the cooperation of our engineers on your most difficult rubber working problems.

NATIONAL-ERIE COMPANY
(Williams Foundry & Machine Division)
Erie, Pa.

National-Erie Platen Presses, of all-steel construction



Automatic Tube Molding Machines

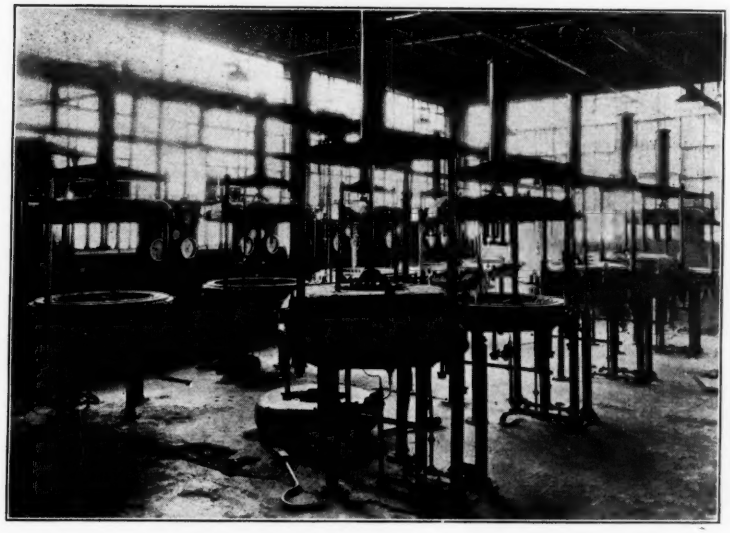
Outside Packed Heater Presses

"Rapido" Tubers have increased production as much as 100%

AKRON-WILLIAMS
Rubber Working Machinery

YOUR MONEY MAKERS

Utility Individual Vulcanizers For Truck and Balloon Tires



Individual Vulcanizers will save you Time, Steam, Cooling Water, and Labor and produce more tires per mold per day.

You can adapt your present molds to these units.

UTILITY MANUFACTURING COMPANY

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Phone: Main 3600

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Bentley's Code

Eastern Sales Engineer
C. O. COREY
P. O. Box 398
Elizabeth, N. J.
Phone: Emerson 9405

California Representatives: LOMBARD J. SMITH COMPANY, 324 No. San Pedro St., Los Angeles, Calif. Phone: Tucker 8917

Close Supervision and Control of Output and Quality

THE BANBURY MIXER affords a distinct advantage in the facilities provided for the control of output and quality.

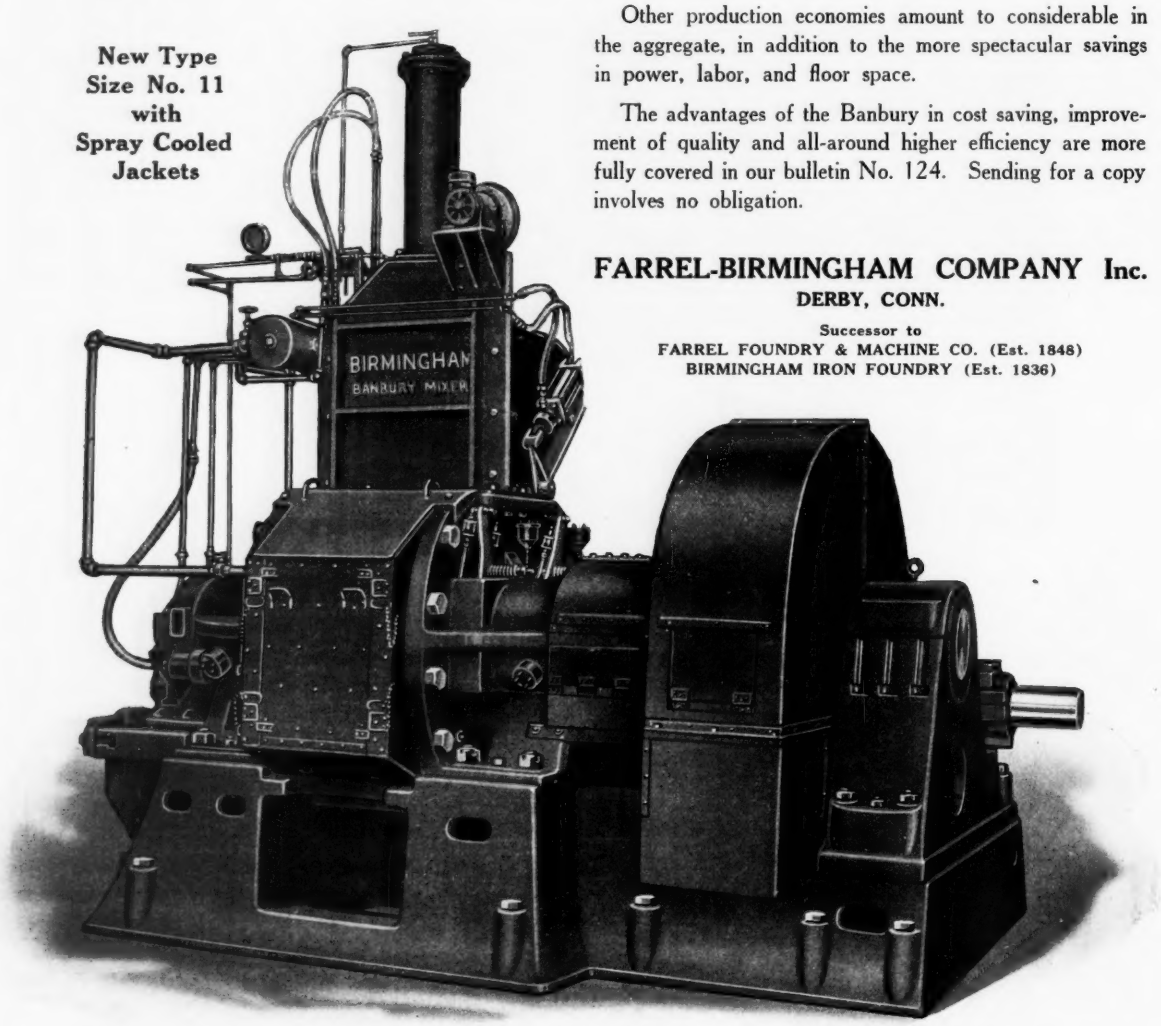
The timing clock specifies the mixing procedure and the recording thermometer produces a record of operation showing the time and temperature at each stage of the mixing cycle for every batch. If stock is subsequently found to be below standard, reference to the record will disclose if the operators lived up to the mixing specifications.

The concentration of operations to fewer machines in a smaller area also makes it possible for one supervisor to oversee the production of a larger volume of stock and makes it easier to maintain standards of quality than where there are a great many operators mixing smaller batches on a larger number of mills.

Other production economies amount to considerable in the aggregate, in addition to the more spectacular savings in power, labor, and floor space.

The advantages of the Banbury in cost saving, improvement of quality and all-around higher efficiency are more fully covered in our bulletin No. 124. Sending for a copy involves no obligation.

New Type Size No. 11 with Spray Cooled Jackets

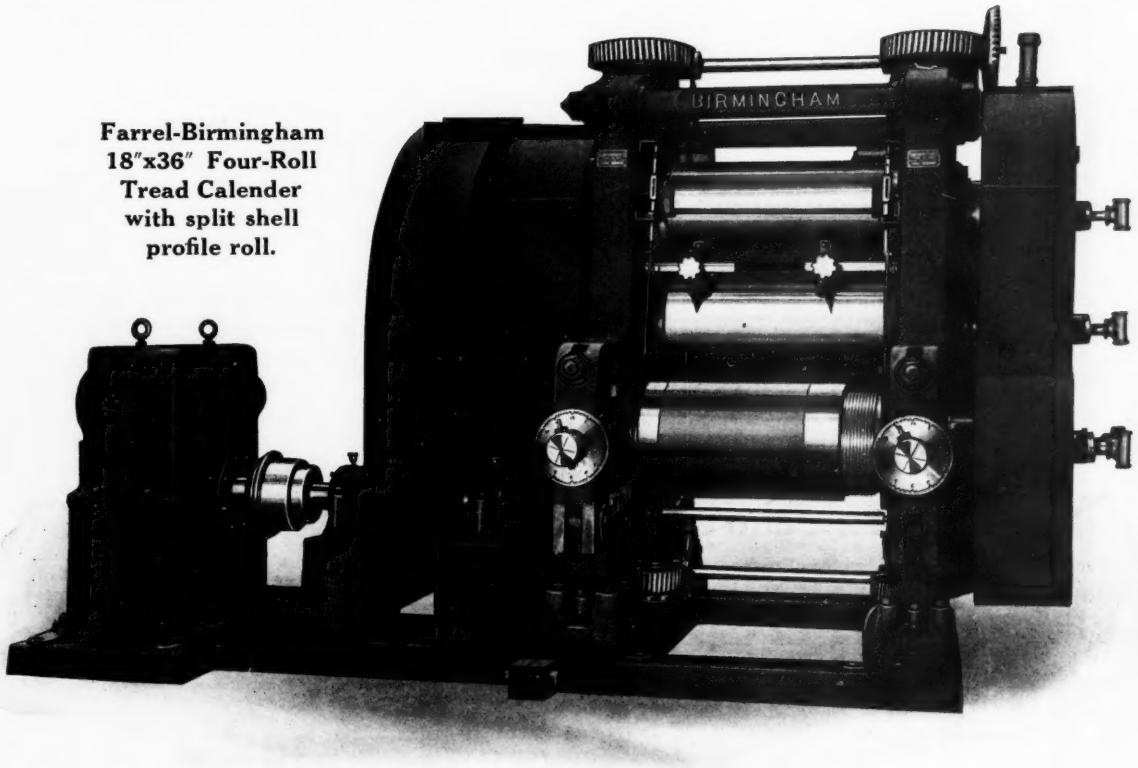


FARREL-BIRMINGHAM COMPANY Inc.
DERBY, CONN.

Successor to
FARREL FOUNDRY & MACHINE CO. (Est. 1848)
BIRMINGHAM IRON FOUNDRY (Est. 1836)

The Banbury Mixer is covered by basic patents in the United States and foreign countries

Better Treads at Less Cost



Farrel-Birmingham 18″x36″ Four-Roll Tread Calender with split shell profile roll.

THE development of the split shell type of profile roll gave the necessary impetus leading to fuller acceptance of the tread calender as the best means of producing tire treads.

It had been conceded that the quality of calendered treads exceeded that of treads produced by other methods and for long, unbroken runs of one size and style the calender had an advantage in lower manufacturing cost.

With the split shell profile roll the objections to the task of changing rolls have been overcome. Now the roll itself remains in the calender and only the shell which has the tread profile cut into it is changed. No piping is disconnected and reconnected for the stuffing box. The result is an appreciable saving in time, labor, and trouble and a great reduction in the investment in profile roll equipment.

The split shell profile roll has given the tread calender greater adaptability for varying production schedules. Even for a number of short runs in the course of a day the time required for changing shells is so small as to be of little importance as a cost factor.

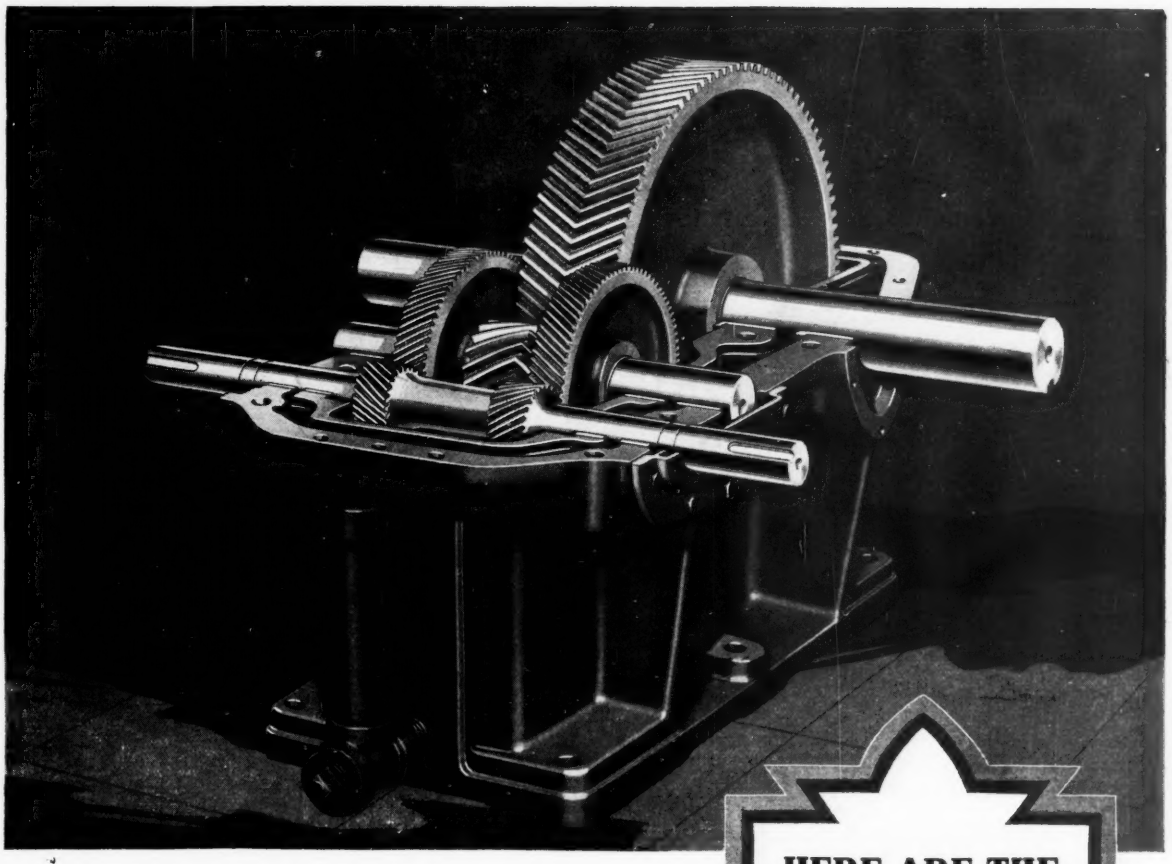
The tread calender has certain other definite advantages, such as greater output, lower power and labor costs, and higher quality. It fits into a continuous production unit to better advantage, all grades of stock can be handled, and uniform gauge more easily maintained.

Farrel-Birmingham tread calenders with split shell profile rolls are made in several sizes to suit various production requirements. An outline of your individual conditions and aims will enable our engineers to be of assistance in the selection and layout of the right unit for greatest efficiency.

FARREL-BIRMINGHAM COMPANY INC.

Successor to
Farrel Foundry & Machine Co. (Est. 1848)
Birmingham Iron Foundry (Est. 1836)

ANSONIA, CONN.



If Uninterrupted Service and Long Life is Vital—Specify Falk! . . .

Among those industries where long and uninterrupted speed reducer service is of vital importance, there is a decided trend toward the Herringbone Gear Speed Reducer as it is built by Falk . . . For the gears in Falk Speed Reducers are cut from specially prepared steel blanks by a process exclusive with Falk . . . The Reducers are simple, compact, oil-tight, dirt-proof, noiseless, free from heat and vibration, permit a higher ratio of reduction per gear, transmit load and transform speed with less friction loss than any other type or kind . . . Read the features listed at right. Send for bulletins describing them in detail, or get in touch with any Falk representative . . .

THE FALK CORPORATION—MILWAUKEE

New York Pittsburgh Detroit San Francisco St. Louis Rochester Albany Akron Chicago Portland Los Angeles Cleveland Wilkes-Barre Birmingham Denver Minneapolis Houston Kalamazoo

Canada: The William Kennedy & Sons, Ltd., Owen Sound, Ontario.
Branches: Halifax Montreal Toronto Cobalt Winnipeg Vancouver

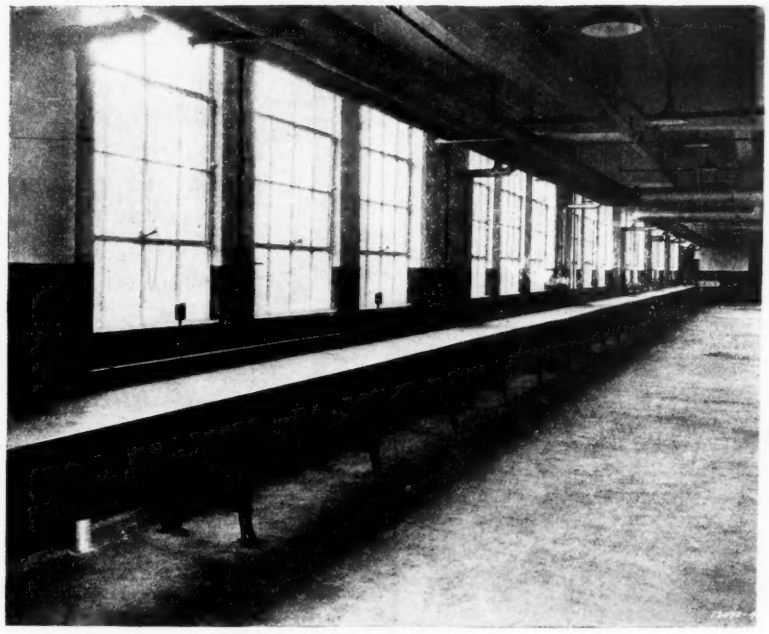
HERE ARE THE FEATURES!

Made in standard sizes and ratios and carried in stock for immediate shipment . . . Excessive capacity—unnecessary to buy oversize reducers . . . Symmetrical arrangement allows equal pressure on bearings and prevents uneven wear and misalignment. All wearing parts are interchangeable and renewable. The entire construction is simple and accessible . . . Patented splash system of lubrication . . . No male and female shafts, bushed gears or overhung studs—nothing but plain bearings and live shafts . . . Highest possible efficiency, maintained throughout life of reducer.

FALK
SPEED REDUCERS

Manufacturers—Herringbone Gears Speed Reducers, Flexible Couplings, Steel Castings and Oil Engines.

CLEAN AS A HOUND'S TOOTH



Pat'd and Pats. Pending

Fig. 969—"Hallowell" Steel Work-Bench
[Continuous]

The Bench Top standing out like a bright streak along the wall suggests a hard, smooth and clean surface — all of which it actually is.

Wouldn't, therefore, a "HALLOWELL" Steel Bench be just the thing on which to handle rubber in its sticky state—or in any other state, for that matter?

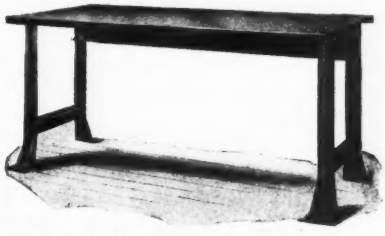
Of course, we also make individual Steel Benches and Tables, like the pictures in the lower corners, in standard lengths of 3 to 10 ft., in fact, we carry 1368 sizes and combinations of "HALLOWELL" Steel Benching in stock.

Pat'd and Pat's Pend'g

Fig. 736—"HALLOWELL" 6 ft. Steel Work-Bench.

The strong, rigid, "HALLOWELL" Steel Bench Legs are identical with those supporting the top of the long Bench.

BULLETIN 386 IS YOURS FOR THE ASKING



Pat'd and Pat's Pend'g

Fig. 848—"HALLOWELL" 6 ft. Steel Work-Table.

Just like Fig. 736 except that top is get-at-able from all four sides.

The one-piece, steel top is hard, flat, smooth and easy to clean.

STANDARD PRESSED STEEL CO.

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BRANCHES
NEW YORK
SAN FRANCISCO
ST. LOUIS

Anderson - Prichard
..... in Oklahoma City Pool

NATIONAL PETROLEUM NEWS - JULY 31

THE Oklahoma City pool continues to occupy the foreground of producing activities in the state.

Two more siliceous lime wells were added to the list of lime producers during the week, bringing the total number of oil wells to nine, and swelling the field's output to a point where it threatened to seriously crowd the pipe line capacity from the field.

Present production from the field, now close to 30,000 barrels daily, the 48 active locations where rigs dot the low, sandy hills southeast of the city, and the new pipe line work being started to provide an outlet for the oil already present and the additional crude expected in the near future—all combine to make the Oklahoma City field the state's leading exhibit of oil producing activity.

DAILY OKLAHOMAN-AUG.7

Standing high among the companies who are benefitted by the new strike is the Anderson-Prichard Oil corporation of Oklahoma City, which has spotted leases around new well, with 14,000 acres of leases in the "discovery" township and those on the east and west. A-P also holds 2,3000 acres in the county.

Within the I. T. I. O. block, the Anderson-Prichard has more royalty than any two other firms combined, estimates J. Steve Anderson, who has been directing operations in this area for the company.

OKLAHOMA NEWS AUG.7

$11,500,000 INVESTED IN OIL DRILLING

Six New Tests Boost City Operations to 92

REPORT SLICK DEAL

Negotiations Opened for Sale Of Holdings for $1,000,000

Negotiations for a $1,000,000 deal between T. B. Slick and the Anderson-Prichard Oil corporation, and the staking of six new locations, bringing the total drilling investment in the Oklahoma City area to $11,500,000, were chief developments in the oil field Wednesday.

The deal is said to involve $1,000,000 in cash and oil that may be produced from the leases. The cash consideration was rumored to be about $600,000.

The Anderson-Prichard corporation of Oklahoma City also owns about 35,000 acres of leases in other parts of the county, a large part of the holdings south of the city and near the development in 11n-3w and 11n-2w.

The Anderson-Prichard corporation operates refineries as well as producing oil.

DAILY OKLAHOMAN NOV-18-1928

Fear of high water in the rivers of Oklahoma has been overcome in the Allen district of Seminole county, where the Canadian river has left its course and cut deep into the north bank to create a new channel.

It was about that time, too, that the Anderson-Prichard Oil corporation of Oklahoma City, decided to get its feet wet in the murky waters. Now it has perfected a system of structures which has met approval of federal and state engineers and specifications have been incorporated in a special bulletin by the bureau of mines for general distribution.

At this time the Anderson-Prichard has a bridge which tied together three locations, being approximately 1,400 feet long and extending halfway across the river. On the Culley Nos. 6, 7 and 8, the derrick structures and bridges cost $60,000, being an average of $20,000 each, but this cost may be reduced, officials say.

The clippings tell the story. We are justified in saying that our company is now in an enviable position.

As a part of a $1,500,000.00 building program, we are now enlarging our refinery—the only one in the industry producing Industrial Naphthas exclusively.

In the future, as in the past, we will provide the same high quality, dependable the year-round, source of supply

ANDERSON-PRICHARD OIL CORPORATION

PRODUCERS AP REFINERS

OKLAHOMA CITY, OKLA.

Akron, Ohio: 910 Savings and Loan Building

BRISTOL'S

Recording Instruments

Faithfully Serving the Rubber Industry in Every Processing~

from the first operation in the manufacture of rubber goods—that of mixing—to the last — vulcanizing — Bristol-time-and-temperature-recording instruments are an important factor.

No matter how carefully you select your raw materials unless they are processed correctly you cannot hope to obtain a uniform or quality product.

Bristol Instruments are used on internal mixers, tire heaters, devulcanizers, presses, vacuum dryers, tube heaters, bead presses, calender rolls, and in virtually every important mechanical operation in the manufacture of rubber goods.

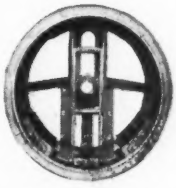
Write for more complete information

THE BRISTOL COMPANY

WATERBURY, CONNECTICUT

Tire Building COSTS

With This Improved Building Drum



The Akron Standard Collapsible, Shoulder Type Drum for building tires by the flat drum method, has many features which mean greater economy in use, and increased service.

The drum is oilless, requiring no attention. It is properly balanced to prevent wear on building machine bearings, and has adjustments to provide for any wear between wedged and hinged sections.

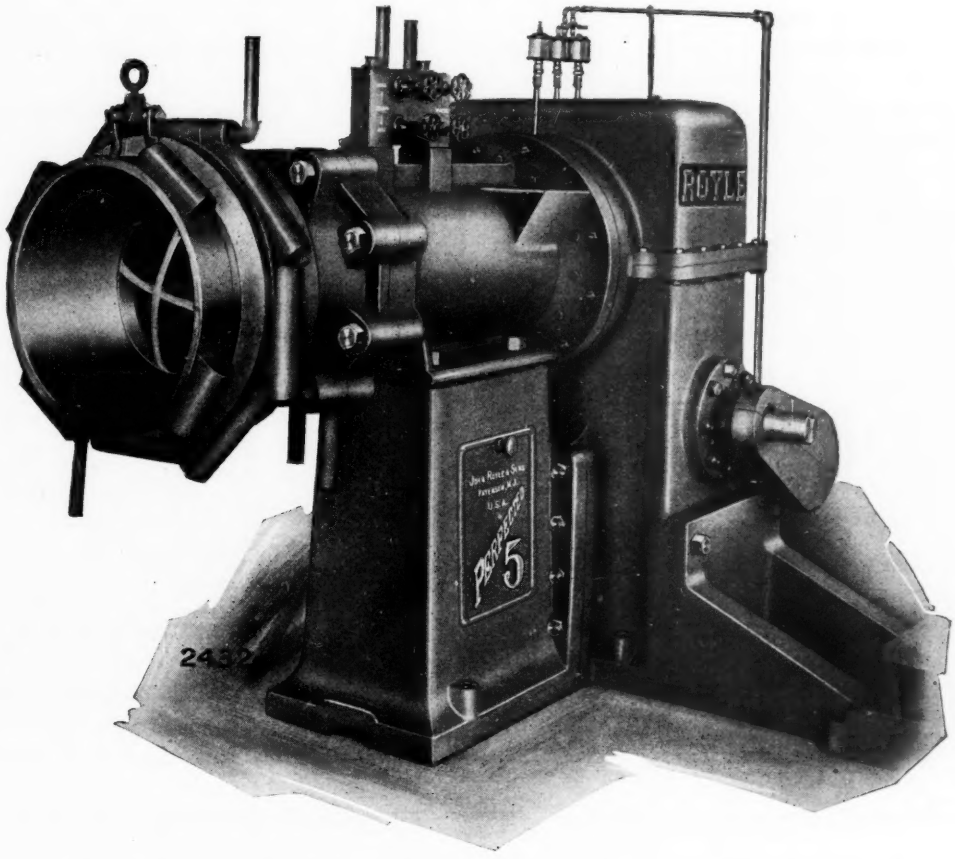
A single operation of breaking lever collapses three sections; likewise a single operation reassembles them. Toggle arms collapse the two hinged sections, which prevents the breaking of hinges.

We manufacture this drum in two models; Model A is the semi-steel drum. Model B has the steel center with semi-steel bead shoulders. Both models have the double widthwise adjustment of bead shoulders.

Cut your building costs with this Drum. Prices and further specification gladly furnished.

The Akron Standard Mold Co.

Akron "The Established Measure of Value" **Ohio**



NEW ROYLE PERFECTED

8-INCH PLANTATION CRUDE RUBBER STRAINING MACHINE

This new Royle straining machine introduces an entirely new principle in the straining of rubber. It has a capacity of 2,000 pounds of plantation crude rubber per hour, through 35 mesh screen. The 8 bolt head gives added strength and is equipped with steam and water circulation, with a screen plate diameter of 16 inches. Head parts are so designed that quick changing is obtained with minimum effort. By adjusting screen sizes suitable break-down and removal of foreign matter is obtained. Details will be furnished on request.

JOHN ROYLE & SONS
PATERSON, NEW JERSEY

Tubing Machines for Rubber Products. Circular Looms for Woven Hose

AKRON REPRESENTATIVES
NATIONAL RUBBER MACHINERY COMPANY

This Reenforcing Carbon is Entirely New

And DOHERTY CONTROL Insures A Permanent and Dependable Supply at Low Cost

GASTEX is permanently in the carbon black field.

It is backed by the resources of Henry L. Doherty & Company, whose policy is to control a product from the raw material to the ultimate consumer. The raw material for GASTEX is natural gas and this Company controls enormous reserves of natural gas in the more important producing fields of this country.

You can be sure of a permanent and dependable supply of GASTEX at a low price.

Our well equipped rubber compounding and testing laboratory, manned by an able technical staff, is at the service of our customers. Let us assist you in determining the most satisfactory method of using GASTEX in your particular types of compounds.

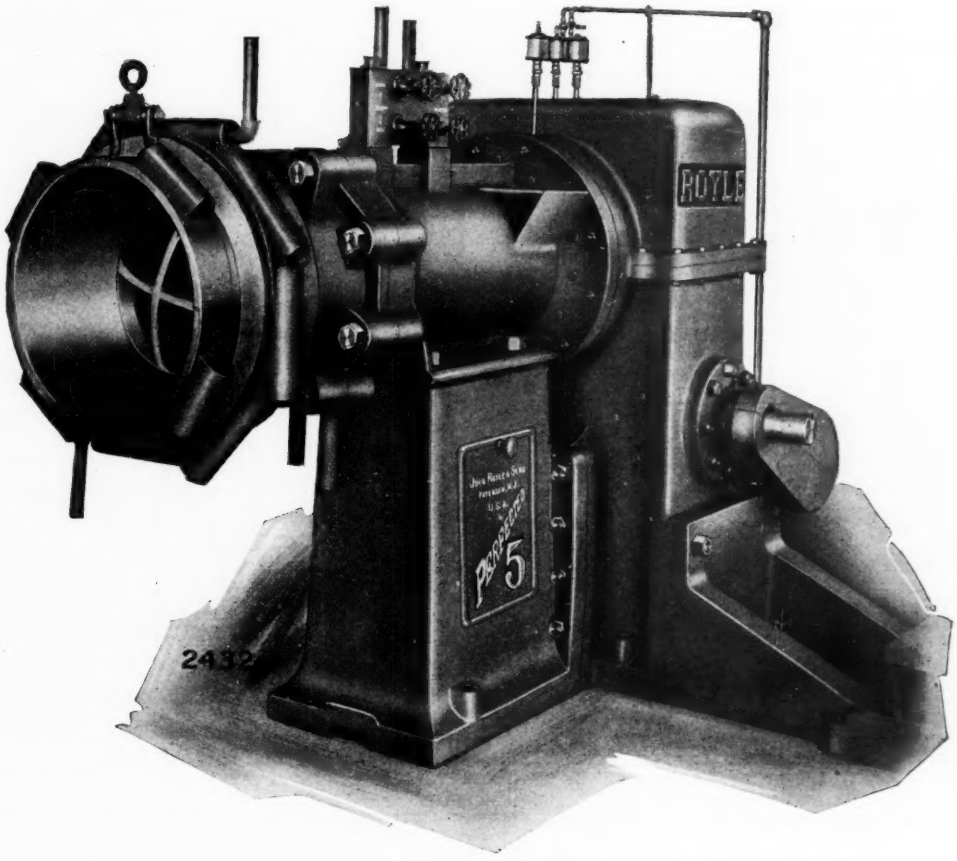
We shall be glad to send you a sample.

Manufactured and Sold by

General Atlas Chemical Company

60 Wall Street △ New York City

(Owned and Controlled by Henry L. Doherty & Company)



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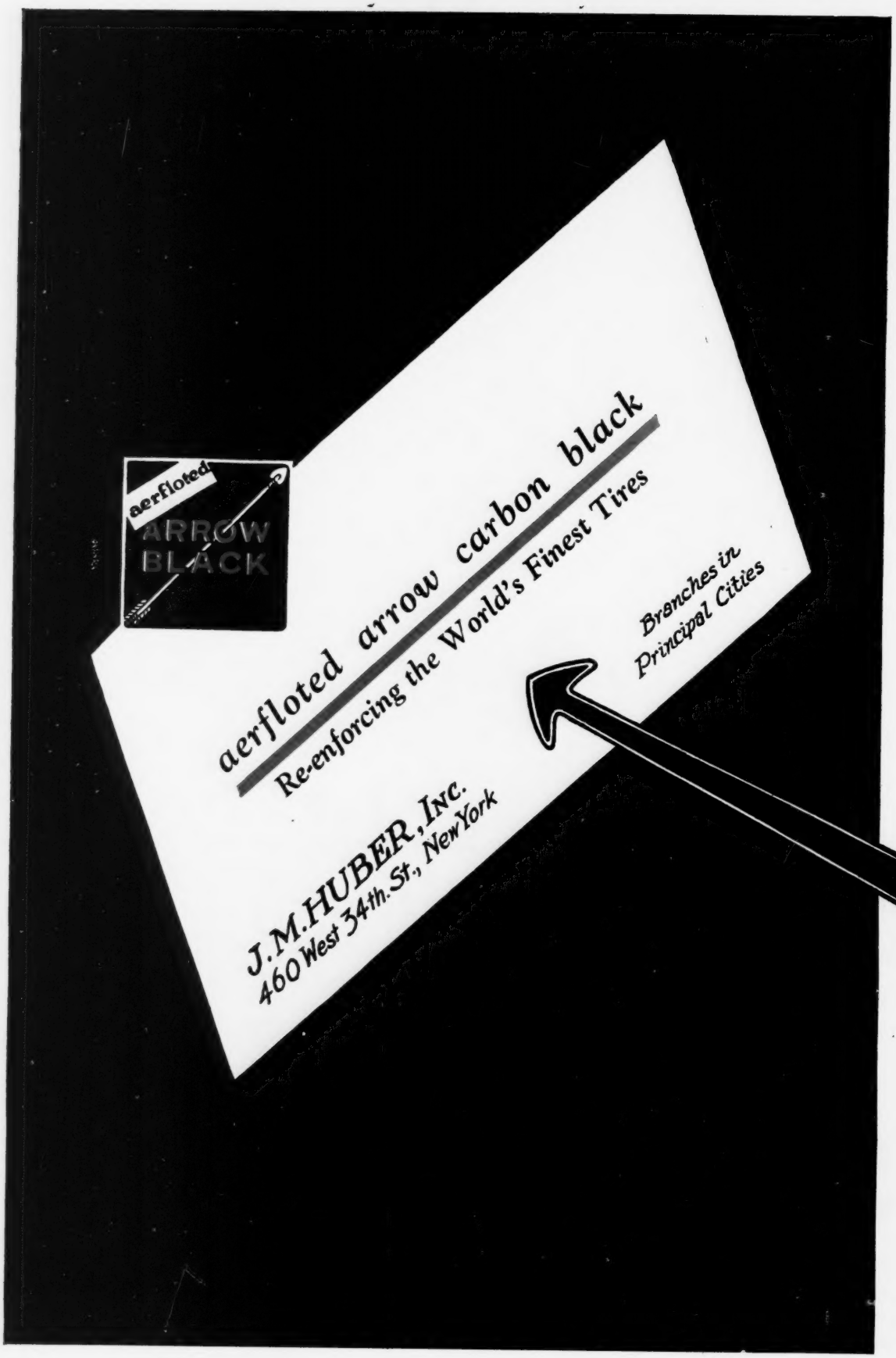
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